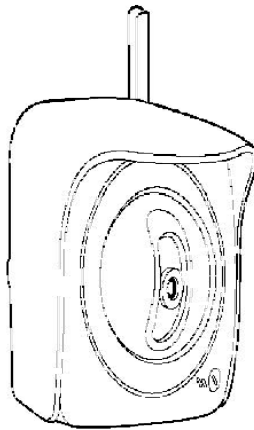


ORDER NO. KMS0412028C1
F5

Service Manual

Network Camera
BB-HCM371A
(for U.S.A.)



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IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF.

Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.

When this mark does appear please read and follow the special instructions described in this manual

on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

1. ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:

In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin, (Sn), Silver, (Ag), and Copper, (Cu).

This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB.

For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

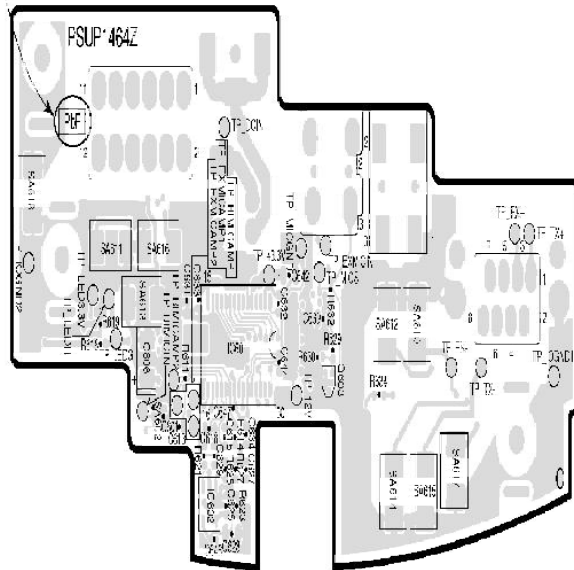
Caution

- PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).
- If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).

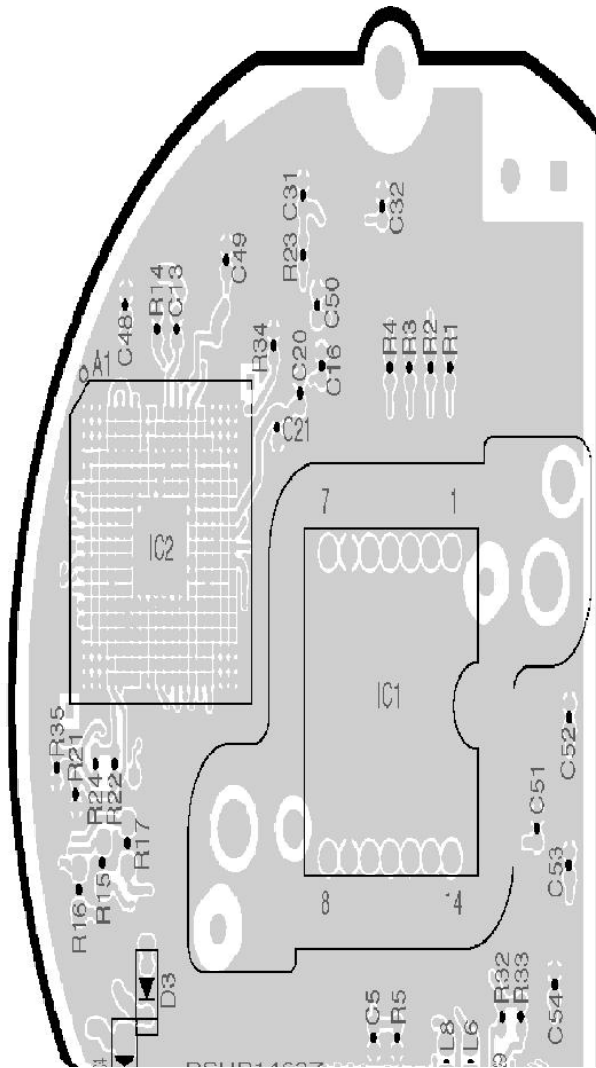
1.1. SUGGESTED PbF SOLDER

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper, (Sn+Ag+Cu), you can also use Tin and Copper, (Sn+Cu), or Tin, Zinc, and Bismuth, (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their products and any precautions for using their product with other materials. The following lead free (PbF) solder wire gauge are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.

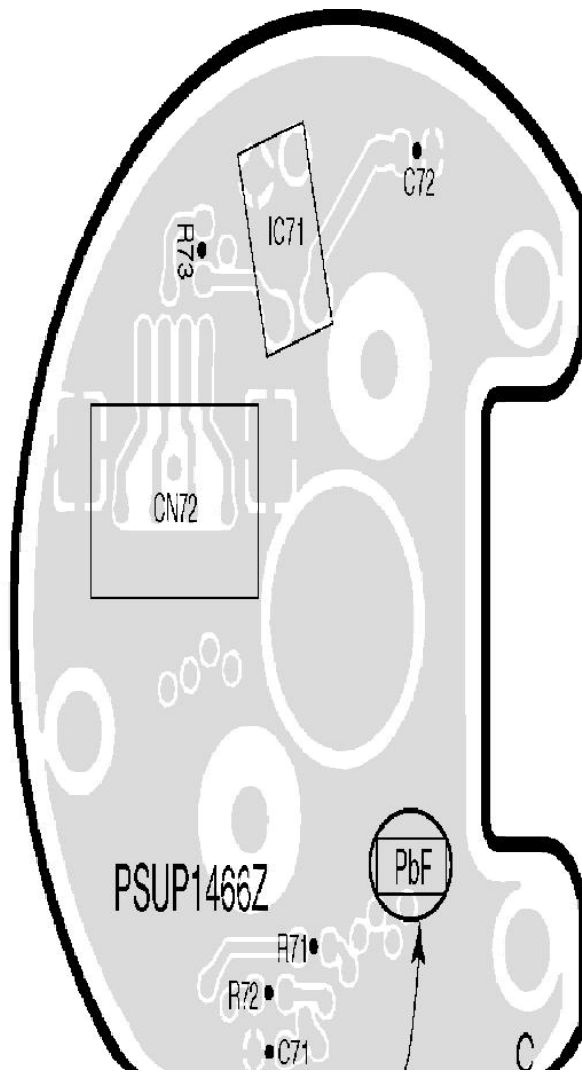
Marked PbF (PbF is marked around here)



CAMERA BOARD

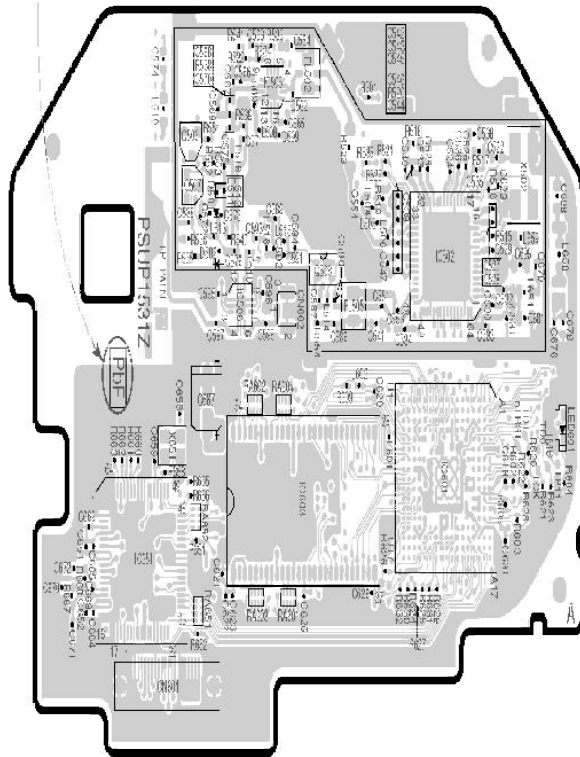


SENSOR BOARD



RF BOARD

Marked PbF, PbF is marked around here:



2. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When replacing, the following precautions will help to prevent recurring malfunctions.

1. Cover the plastic parts with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the work-table.
4. Do not grasp IC or LSI pins with bare fingers.

3. CAUTION

3.1. SAFETY PRECAUTIONS

1. Before servicing, unplug the power cord to prevent an electrical shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.

5. Before returning the serviced equipment to the customer, make the following insulation resistance test to prevent a shock hazard.

3.2. BATTERY CAUTION

Danger of explosion if the battery is replaced incorrectly. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to following caution:

Disposal of lithium batteries should be performed by permitted, professional disposal firms knowledgeable in state government federal and local hazardous materials and hazardous waste transportation and disposal requirements.

A battery continues to have no transportation limitations as long as it is separated to prevent short circuits and packed in strong packaging.

Commercial firms that dispose of any quantity of lithium cells should have a mechanism in place to account for their ultimate disposition. This is a good practice for all types of commercial or industrial waste.

When the lithium battery is exchanged, the clock settings are cleared. In this case, make clock settings again.

Recommend Type Number:

BR-2032-1VC (BAT401) Manufactured by MATSUSHITA

3.3. TRADEMARKS

- Adobe, Acrobat and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.
- Ethernet is either a registered trademark or a trademark of Xerox Corporation in the United States and/or other countries.
- Microsoft, Windows and ActiveX are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
- Pentium is a trademark or registered trademark of Intel Corporation or its subsidiaries in the United States and other countries.
- SD mark is a trademark of the SD Card Association.
- Screen shots reprinted with permission from Microsoft Corporation.
- All other trademarks identified herein are the property of their respective owners.

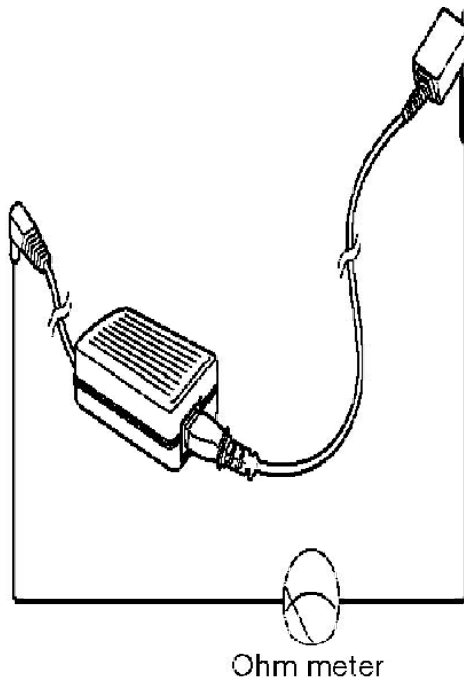
3.4. INSULATION RESISTANCE TEST

1. Unplug the AC power cord and short the two prongs of the plug with a jumper wire.
2. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screw threads, etc.

Note:

Some exposed parts may be isolated from the chassis by design. These will read infinity.

- 3. If the measurement is outside the specified limits, there is a possibility of shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.**



Resistance = more than $1\text{M}\Omega$ (at DC 500 V)

3.5. POWER CAUTION

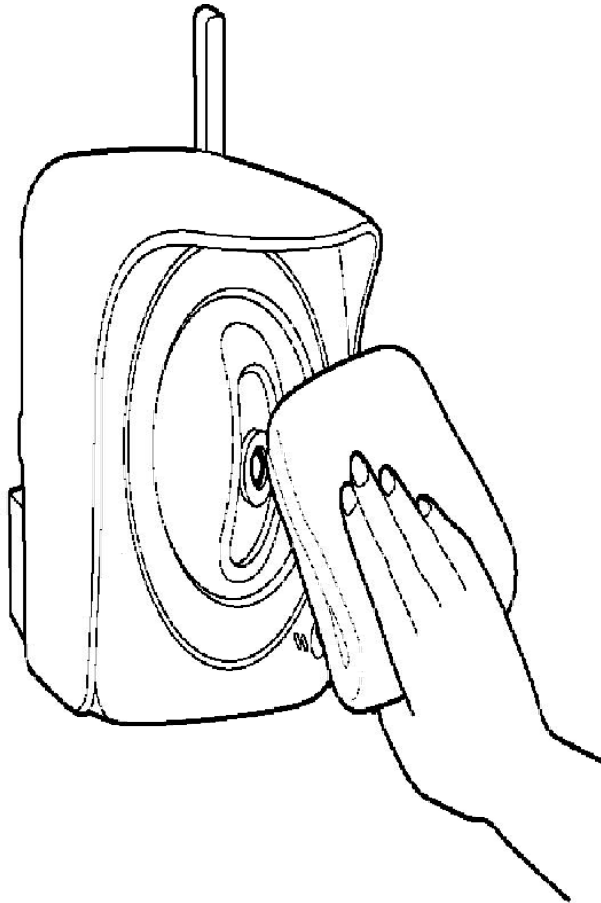
The power socket wall outlet should be located near this equipment and be easily accessible.

3.6. CLEANING

After the camera is turned off by disconnecting the AC plug, clean the camera.

3.6.1. Cleaning the Main Unit

If the lens cover has the sand or the dust, image quality may decrease. After taking away the sand or the dust on it, wipe it with a dry cloth.



Note:

- **Do not use alcohol, polishing powder, cleanser, benzine, thinner, wax, petroleum products or hot water to wipe the camera. Also avoid glass cleaner, pesticide or hair spray. They may cause change in the shape or color.**
- **Do not directly touch the lens cover. Your fingerprints can cause the image to be out of focus.**
- **Do not directly pour the water with a hose to wash the unit or the lens cover.**

4. SPECIFICATIONS

Network Camera

Items	Specifications
Pan/Tilt Angle	Pan: -60° to +60°, Tilt: -45° to +20°
Number of Pixels	1/4-inch CCD Sensor 320,000 pixels
Illuminance	3-100,000 lx (0.2-100,000 lx in color night view mode)
White Balance	Auto/Manual/Hold
Focus	Fixed 0.5m (20 inches) - Infinity
Caliber Ratio (F No.)	F3.5
Horizontal Viewing Angle	53°
Exposure	Auto

Wireless Specifications

Items	Specifications
Communication mode (Communication Standard)	IEEE 802.11b, 802.11b/g, 802.11g exclusive
Data Transfer Mode	Direct Sequence Spectrum Spread (DS-SS), Orthogonal Frequency Division Multiplexing (OFDM)
Frequency Range	2.412-2.462 GHz
Channel	1-11
Security	WEP (64/128/152 bit)

Other Specifications

Items	Specifications
Splash Resistant Standard	IPX4
Video Compression	JPEG (3 Levels)
Video Resolution	640 x 480, 320 x 240 (default), 160 x 120
Buffered Image *1	About 125 frames (320 x 240) with time display (When SD memory card is not inserted.)
Audio Communication	2-way Half Duplex
Audio Bandwidth	300 Hz-3.4 KHz
Audio Play Method	Play with ActiveX
Input Encoding Method	Encoding with ActiveX
Audio Input	Built-in Microphone or External Microphone Input Terminal
Audio Output *2	Audio Line Output Terminal for External Speaker
Frame rate *3	Max.12 frames/second (640 x 480) Max.30 frames/second (320 x 240 or 160 x 120)
Supported Protocols	IPv4/IPv6 Dual-Stack -IPv4: TCP, UDP, IP, HTTP, FTP, SMTP, DHCP, DNS, ARP, ICMP, POP3, NTP, IPsec, UPnP -IPv6: TCP, UDP, IP, HTTP, FTP, SMTP, DNS, ICMPv6, POP3, NDP, NTP, IPsec
IPsec Feature	ESP Encryption, ESP Authentication Transport mode/Tunnel mode IKE (Internet Key Exchange)

Items	Specifications
IKE (Internet Key Exchange)	Pre-Shared Key
Cipher Algorithm	DES-CBC, 3DES-CBC, AES-CBC
Message-Digest Algorithm	HMAC-MD5, HMAC-SHA-1
Message Transfer Condition	Alarm or Timer
Image Transfer Method	SMTP, FTP
Interface	Wired: 10Base-T/100Base-TX Ethernet RJ-45 connector x 1 Wireless: IEEE 802.11b/g (Embedded)
Indicator Display	Power/Network Communication/Camera operation/Ethernet link
External Microphone Input	Ø3.5 mm Mini Jack
Audio Output	Ø3.5 mm Stereo Mini Jack (But output is mono.)
External I/O	External Sensor Input x 2 External Sensor Output x 1
SD Memory Card Slot	Full Size
Dimension (HWD)	About 100 mm (3.94 inches) x About 100 mm (3.94 inches) x About 80 mm (3.15 inches)
Weight	350 g (0.78 lb.) (Only the unit)
Power Supply	AC adaptor: Input 120 V AC, 60 Hz Output 12 V DC, 750 mA Consumption: Wired 3 W (6.5 W during pan/tilt scan), Wireless 6 W (10 W during pan/tilt scan)
Temperature	Operation: -20 °C (-4 °F) to +50 °C (+122 °F) Storage: -25 °C (-13 °F) to +60 °C (+140 °F)
Humidity	Operation: 20%-90% (No Condensation) Storage: 20%-90% (No Condensation)

- *1) The maximum number of frames changes depending on the image quality and what object you buffer.
- *2) Connect it to an amplifier or an external speaker with a built-in amplifier.
- *3) Frame rate may slow down depending on the network environment, the PC performance, the image quality, enabling IPsec, SD memory recording or what object you view.

5. MAIN FEATURES

Splash Resistant body for indoor and outdoor use

Your Panasonic Network Camera has a splash resistant body. The splash resistant body allows the camera to be used indoors or outdoors.

Wireless Communication

Network Camera corresponds to the wireless system based on IEEE 802.11b/g. Wireless installation will play an increasing role in flexible mounting.

Communication via Ethernet cable is also available *1. Encryption establishes the security on the

wireless network.

IPv6*2 Network Camera

Your Panasonic Network Camera supports IPv6 (Internet Protocol Version 6), IPv6 was created to address the additional IP addresses that will be needed as the Internet continues to expand. Since the camera also supports IPv4 that's currently used, it is "dual stack" design will seamlessly operate while IPv6 is phased in. For more information in IPv6 you wish to visit <http://www.ipv6.org/>. See the Operating Instructions for more information.

Audio 2-way Communication*3 (Walkie-talkie Type)

Your Panasonic Network Camera now provides 2-way audio, between the camera and your PC. You will be able to hear the person on camera and respond using a microphone connected to your PC's sound card (customer-provided.) They will hear your response through the amplified speaker (customer-provided) connected to the camera.

For example, the camera can be used in the following various locations:

- **In the baby's room, to hear if the baby is crying.**
- **At the front door, to see and hear who is at the door.**
- **In the children's play room, to see and hear if they are safe.**

Note:

PLEASE NOTE that under certain circumstances, audio/video recording may be **PROHIBITED** by law. This device should be used only in compliance with all applicable federal, state and local statutes.

Better Image Quality

The CCD sensor and the color night view mode provides better image quality and low light performance.

- **The CCD sensor gives you clear image.**
- **You can monitor live video (Motion JPEG) that refreshes its image 30 frames per second.**
- **Color night view mode allows you to monitor the camera in low illuminance.**

Various Camera Control Features

The camera pans or tilts fast in maximum 80° per second. (The previous model: 21° per second) You can control the camera at high speed from your PC or mobile phone. Alarm position feature also allows the camera to automatically turn the lens to the alarm position. Additionally, the following control features are available to easily and quickly monitor the camera.

Click to Center...When you click a certain point on the camera image, the point is centered on the image.
Preset Position...You can register 8 preset positions. When you click each button, the image switches to its position.

Output Control...You can control the external devices (Open or Short to GND) (E.g., turning the light on or ringing a buzzer).

SD Memory Card*4 Recording

The camera has an SD memory card slot. You can record camera images to the SD memory card. If you enable alarm buffer/transfer, you can record the image at the timing of signal detection of door sensor or light. About 58,000 images (320 x240 resolution and standard quality) can be recorded to 1 GB SD memory card. If you enable 1-minute interval timer buffer/transfer, you can record the images for about 41 days.

Enhanced Multi-Camera Page

Multi-Camera page displays up to 4 cameras while supporting each audio 2-way communication. The previous model displays only 4 cameras, but this camera can switch 3 sets of 4 cameras. Additionally, the camera can display maximum 12 cameras on a page in a static image.

Supporting Viewnetcam.com service

Viewnetcam.com service allows you to access the camera over the Internet with your favorite domain name (E.g., bob.viewnetcam.com) instead of a global IP address.

Multi-Language Display

Top page, Single Camera and Multi-Camera page can be displayed in English, French, German, Italian, Spanish, Russian, Simplified Chinese or Japanese. The Setup, Maintenance and Support pages are displayed only in English or Japanese.

*1) It is not possible to access the camera simultaneously by both wired and wireless connection.

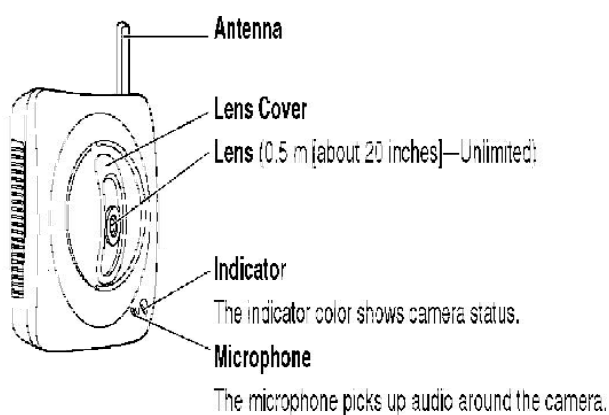
*2) To connect in IPv6, subscribe to the ISP's "IPv4/IPv6 Dual-Stack" or "IPv6 over IPv4 Tunneling" service. The camera does not work in IPv6-only network.

*3) Audio feature does not work on cell phones. Talk button and Listen button cannot be used simultaneously. In consequence of traffic and network environments, the audio may be delayed or may break up.

*4) SD memory card is sold separately. The camera supports 1 GB, 512 MB, 256 MB, 128 MB or 64 MB Panasonic SD memory card.

6. PARTS LOCATIONS

6.1. FRONT VIEW



Indicator Display

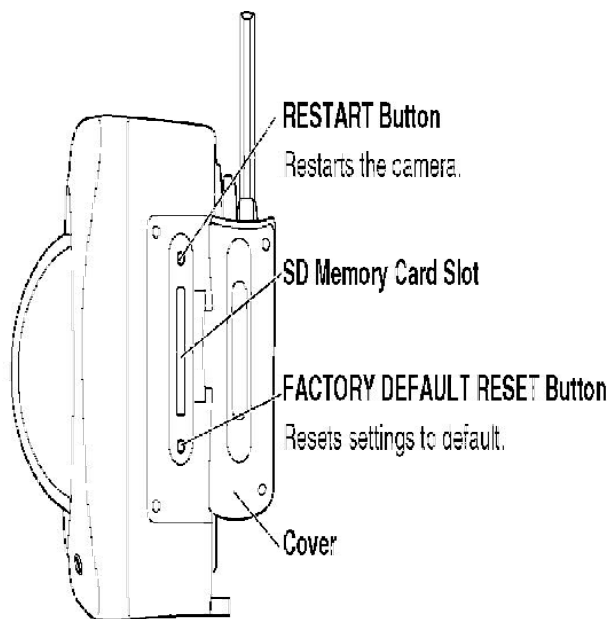
Power on	Not on the LAN	Orange blinking
	On the LAN	Orange → Green blinking Green
Normal Operation *1		Green
Automatic Setup	Setting	Green blinking
	Finished setting	Green blinking → Green
Using DHCP	Getting IP address *2	Green blinking
	Got IP address	Green
Updating Firmware		Orange blinking
Pressing FACTORY DEFAULT RESET button		Orange blinking → Turning off (The camera restarts after that.)
UPnP ™ Failure		Orange blinking (About a 2-second interval)
Internal Failure		Red blinking *3

*1) The indicator turns orange if the camera is not connected to the LAN.

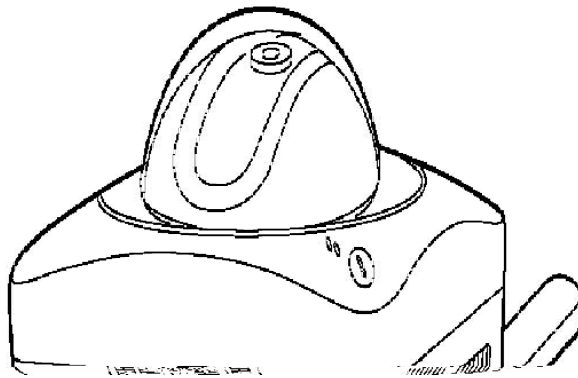
*2) The indicator blinks orange if the camera is not connected to the LAN.

*3) See the Installation/Troubleshooting.

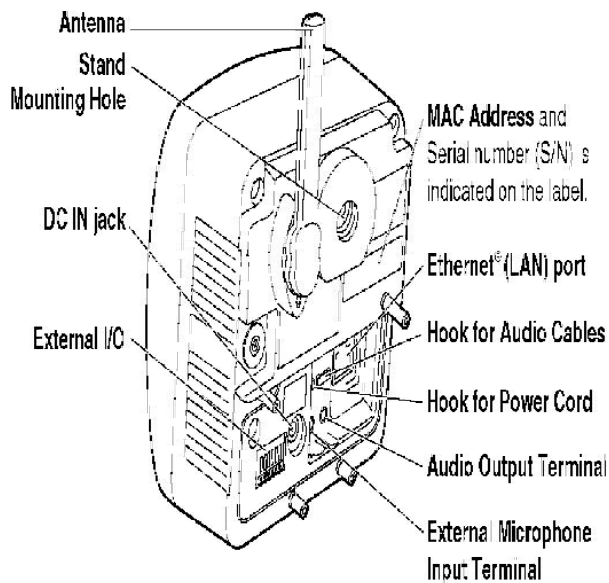
6.2. SIDE VIEW



6.3. BOTTOM VIEW



6.4. REAR VIEW



Note:

When installing the external microphone and external speaker outdoors, they must be for outdoor use.

7. CONNECTING YOUR NETWORK CAMERA

7.1. PREPARATION

Prepare the following before connecting the Network Camera.

- Set up software (Setup CD-ROM)
- PC to fulfill the system requirements.
- Ethernet Router for LAN Connection.
- Ethernet cable (two pieces of Category 5 straight cable).

System Requirements for your PC

Your PC (Personal Computer) and network must meet the following technical specifications for the camera to work properly.

For IPv4 Connection

Item	Description
Operation System	Microsoft® Windows® XP Microsoft® Windows® 2000 Microsoft® Windows® Me Microsoft® Windows® 98SE
CPU	-For viewing single camera Pentium® III (800 MHz or greater is recommended.) -For viewing multiple cameras Pentium 4 (1.8 GHz or greater is recommended.)
Protocol	TCP/IP protocol (HTTP, TCP, UDP, IP, DNS, ARP, ICMP)
Interface	10/100 Mbps network card installed
Web Browser	Internet Explorer 6.0 or later (Not included on the Setup CD-ROM)
Audio	Audio input/output feature (Microphone or speaker)

For IPv6 Connection

Item	Description
Operation System	Microsoft® Windows® XP Service Pack 1 or later
CPU	-For viewing single camera Pentium III (800 MHz or greater is recommended.) -For viewing multiple cameras Pentium 4 (1.8 GHz or greater is recommended.)
Protocol	TCP/IP protocol (HTTP, TCP, UDP, IP, DNS, ICMPv6, NDP)
Interface	10/100 Mbps network card installed
Web Browser	Internet Explorer 6.0 or later (Not included on the Setup CD-ROM)
Audio	Audio input/output feature (Microphone or speaker)

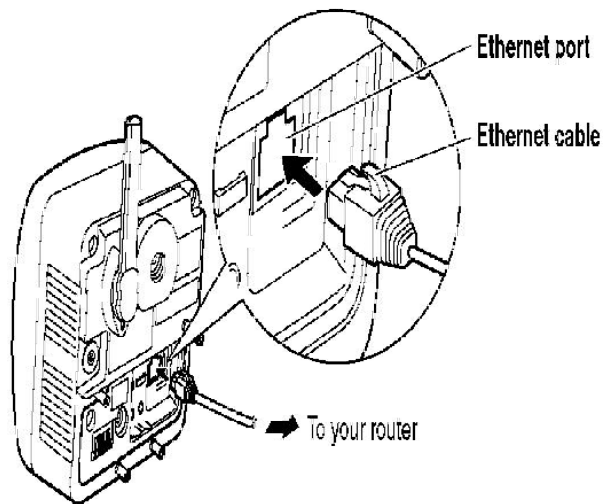
Note:

See Panasonic Network Camera support website at <http://panasonic.co.jp/pcc/products/en/netwcam/> for details about network environment.

7.2. CONNECTING THE CAMERA TO YOUR ROUTER

Connect the camera to your router with an Ethernet cable to set up the camera.

1. Connect the Ethernet cable (customer-provided) to the camera.

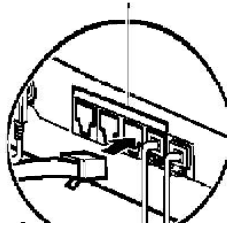


Note:

These instructions assume your PC is already connected to the Internet and your network includes a router.

2. Connect the Ethernet cable to your router.

To a LAN port of your router

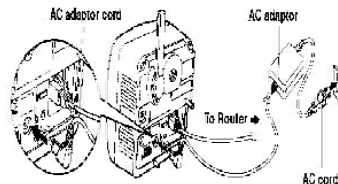


3. Connect the AC adaptor cord to the DC In jack, and plug the AC cord into the outlet.

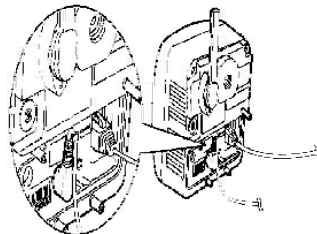
- The AC cord is used as the main disconnect device, ensure that

the socket-outlet is located/installed near the equipment and is easily accessible.

- Use only specified Panasonic AC adaptor PQLV202 (Order No. PQLV202W).
- If the indicator does not light green, see the Installation/Troubleshooting.
- A noise can be heard during pan/tilt operation. This is normal.



4. Hook the power cord to the Hook for Power Cord.



7.3. SETTING UP THE CAMERA TO VIEW ON THE LAN

Setup CD-ROM allows you to easily set up the camera.

Note:

- To avoid any possible problems, temporarily disable any firewall or antivirus software.
- This procedure explains installation of the camera on the same network that your PC is part of.
- Before proceeding, close your web browser.
- See the Operating Instructions on the Setup CD-ROM for details.
- To set the Wireless Configuration, the wireless LAN settings of your router-SSID, communication mode and encryption etc.-are required. (See your wireless router's manual for your reference to the wireless LAN settings.)
- When there are some cameras or PCs that are communicating wirelessly, the IP addresses may overlap and the camera may not be able to communicate. See the Operating Instructions on the Setup CD-

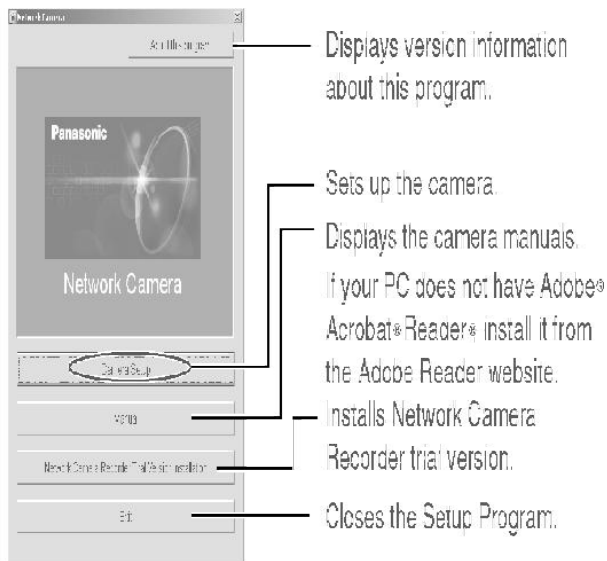
ROM.

1. Insert the Setup CD-ROM into the CD-ROM drive of the PC.

- The window is automatically displayed.

(If the Network Camera Setup window is not displayed automatically, double-click "Setup.exe" file on the Setup CD-ROM.)

2. Click [Camera Setup].

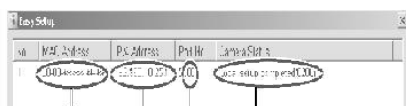


- When the following dialog box is displayed, click [Unblock].



3. Select the camera to set up and click [Execute].

- This program searches for the cameras that are connected to the router and displays the MAC Addresses, IP addresses and Port Numbers.



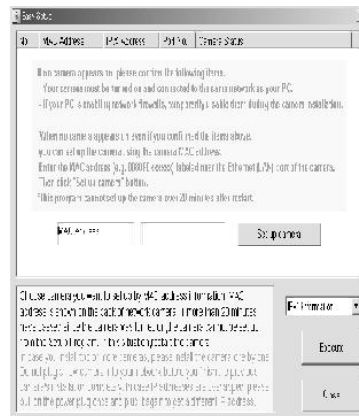
- The MAC Address on the rear side of the camera shows which camera you select on the Camera List window.

Note:

- If the indicator does not light green, check the connection.
- If more than 20 minutes have passed since the camera was turned on, the camera cannot be set up from the Setup Program. In this situation,

disconnect the AC cord from the outlet, and reconnect it again.

- The Setup Program may not list any cameras due to your firewall or antivirus software settings on your PC. If you cannot disable your firewall or antivirus software, you can set up the camera entering the camera MAC address on the following window. The camera's MAC address can be found on the label affixed to the back of each camera.



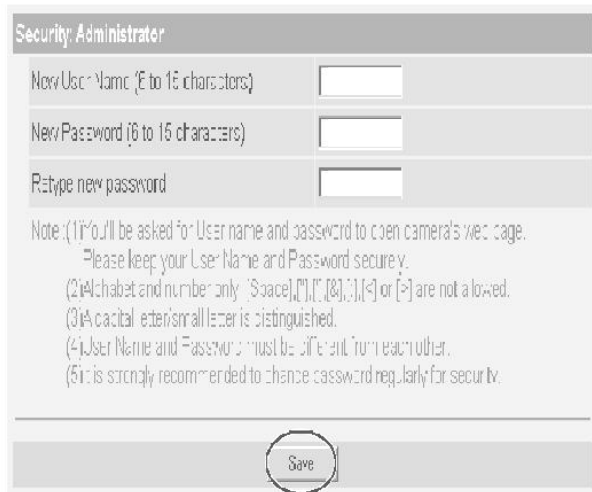
4. Click [Automatic Setup (Local Access Only)].



- For the first time installation or after pressing the FACTORY DEFAULT RESET button, only [Automatic Setup (Local Access Only)] can be selected. To set up the camera with Static or DHCP settings, after

performing the [Automatic Setup (Local Access Only)], run the Setup Program again and select [Manual Setup].

5. Enter the user name and password you wish to use, and click [Save].



Security: Administrator

New User Name (6 to 15 characters)


New Password (6 to 15 characters)

Retype new password

Note: (1) You'll be asked for User name and password to open camera's web page.
(2) Please keep your User Name and Password securely.
(3) Alphabet and number only (Space, '[]', '[&]', '[<]' or '[>]' are not allowed).
(4) A capital letter/small letter is distinguished.
(5) User Name and Password must be different from each other.
(6) It is strongly recommended to change password regularly for security.

Save

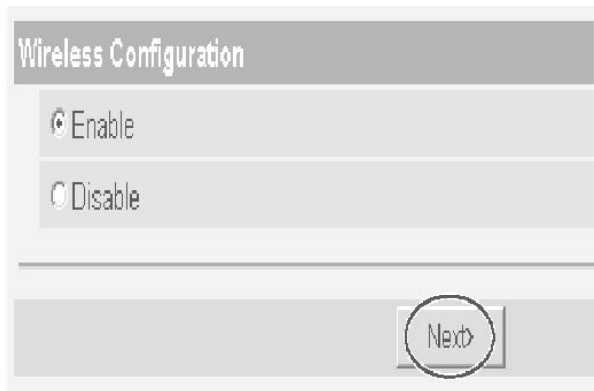
6. Enter the name and password that were entered above, and click [OK].



Enter Network Password

Please type your user name and password.

7. To set the Wireless Configuration, check [Enable] and click [Next>].
- When [Disable] was selected, skip to step 9.



- The Wireless Configuration can also be set at [Wireless] in the Setup Page.

8. Set the Wireless Configuration according to the wireless settings of the router and click [Next>].



- Encryption is a help to avoid being read the data within wireless LAN by others.
- Enter both the MAC addresses for the camera itself and the camera's wireless module to enable the MAC address filtering feature on the wireless router. The wireless module MAC address is one value higher than the camera MAC address.

9. When the Single Camera page is displayed, the setup is completed.

- When Security Warning window is displayed, click [Yes].

- See the Installation/Troubleshooting for Security Warning window when using Microsoft Windows XP Service Pack 2.



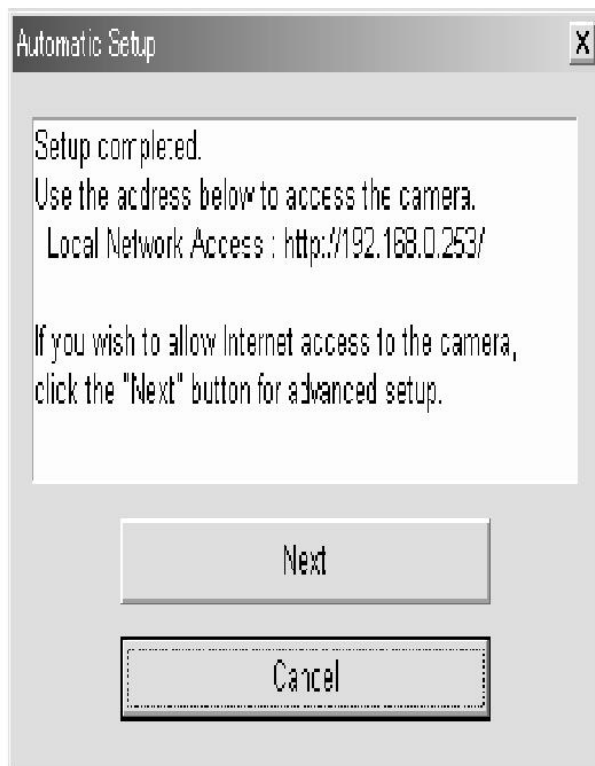
Note:

To ensure that the most current image is displayed, Internet Explorer should be configured as follows. This will not have any negative result on normal use.

1. While viewing any website, Click [Tools] [Internet Options].
2. In the section "Temporary Internet Files", click [Settings] and check [Every visit to the page].

To enable Internet access to the camera

Click [Next] to set up the Internet access to the camera and go to step 3 on the page 23 of the Installation/Troubleshooting.



- If you do not allow the Internet access, click [Cancel], and go to page 36 of the Installation/Troubleshooting to confirm the camera image.

8. DISASSEMBLY INSTRUCTIONS

8.1. HOW TO REMOVE MAIN BOARD, I/O BOARD AND RF BOARD

- | | |
|---|--|
| <ol style="list-style-type: none">1. Remove four Screws (B).2. Remove Cabinet Cover and Antenna Connector from RF Board. | |
| <ol style="list-style-type: none">3. Remove three Screws (A).4. Remove RF Spacer and RF Board from Cabinet Body.5. Remove Connector E, from RF Board. | |

- | | |
|---|--|
| <p>6. Remove Main Board and I/O Board from Cabinet Body.</p> <p>7. Remove Connector A, Connector B and Connector C.</p> | |
|---|--|

8. Remove FFC Cable from Main Board and I/O Board.

8.2. HOW TO REMOVE LENS UNIT AND SENSOR BOARD

1-7 are the same as 8.1. **HOW TO REMOVE MAIN BOARD, I/O BOARD AND RF BOARD.**

<p>8. Remove two Screws (A).</p> <p>9. Remove Pan Motor Unit, Pan Gear and Eye Block from Cabinet Body.</p>	
<p>10. Remove two Screws (D).</p> <p>11. Remove Tilt Motor Unit.</p>	
<p>12. Remove two Screws (D).</p> <p>13. Remove Eye Left Cover, Lens Block and Eye Center Cover from Eye Right Cover.</p>	

14. Remove two screws (D).

15. Remove Lens Unit from Lens Cover.

16. Remove FPC Tape and CORE Tape from Eye Right Cover.

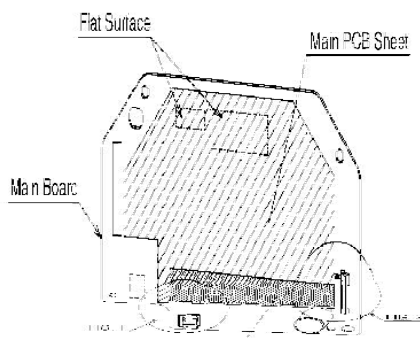
17. Pull Connector B and remove Tilt Motor Unit.	
18. Remove two Screws (D).	
19. Remove Sensor Board and Filter from Eye Right Cover.	

20. Remove Sensor Board from FPC Cable.

9. THE CAUTIONS AT THE TIME OF ASSEMBLY

9.1. CAUTIONS FOR SHEET ATTACHMENT

Attach the Main PCB Sheet to the Main Board and then attach the Sheet to it.



Caution:

See the Figures for the position in the attachment of the Main PCB Sheet

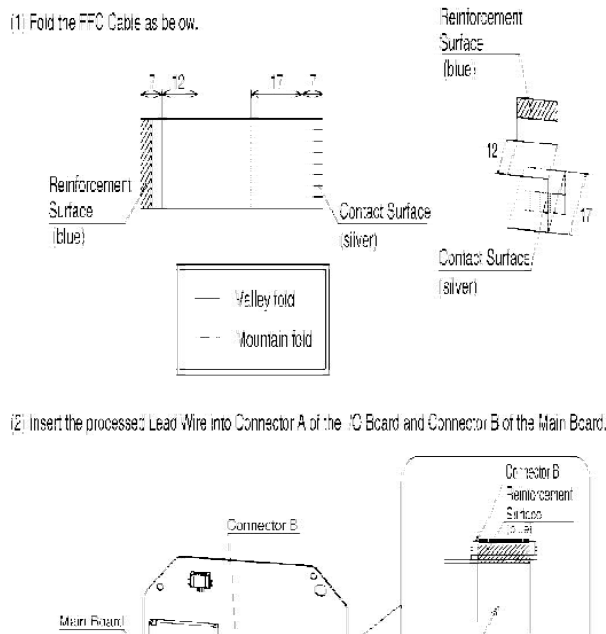
and the Sheet.

Press the Flat Surface shown in the Figure, then press the whole sheet securely to avoid peeling.

The Sheet should cover the connector and not cover the Connector Lock in FIG. 2.

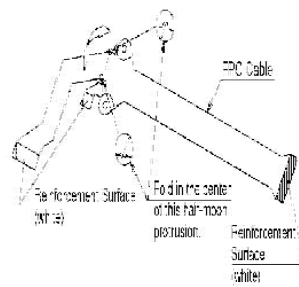
9.2. CAUTIONS FOR FFC CABLE ATTACHMENT

Process the FFC Cable to insert to the connectors of the I/O Board and the Main Board.



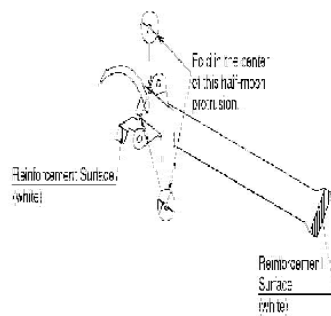
9.3. CAUTIONS FOR FPC ATTACHMENT

1. Fold the FPC Cable in the direction of the arrow in the position of the half-moon top protrusion (sharp line) as shown below.

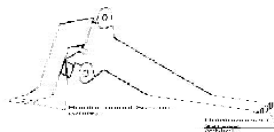


Caution:
When folding the FPC, be careful not to damage it.

2. Fold back the FPC Cable in the direction of the arrow in the position of the half-moon top protrusion (sharp line) as shown below.

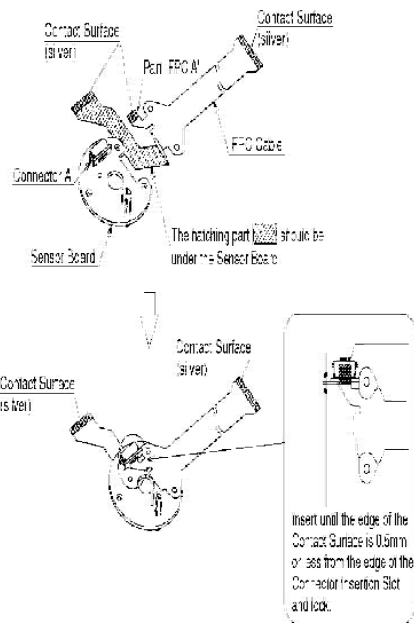


3. Completion of folding.

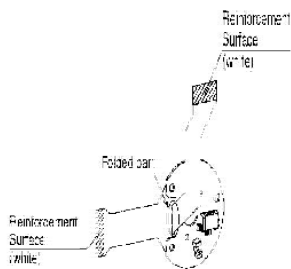


4. Attach the FPC Cable to the Sensor Board.

(1) Insert Part FPC A of the FPC Cable into Connector A of the Sensor Board and lock it.

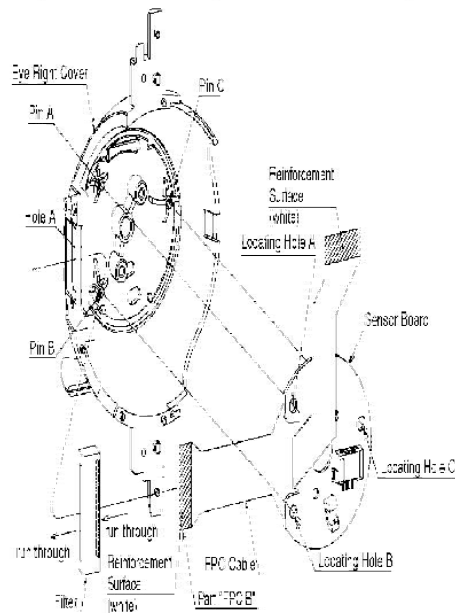


(2) Arrange the form of the folded part of the FPC Cable as shown below.



3. Attach the Sensor Board to the Eye Right Cover and fix it with the Screws (C).

- (1) Put Part "FPC B" of the FPC Cable through the Filter and Hole A of the Eye Right Cover from inside.
Align the Locating Holes of the Lead Wire and Locating Holes A and B of the Sensor Board put each locating pin.



Caution:

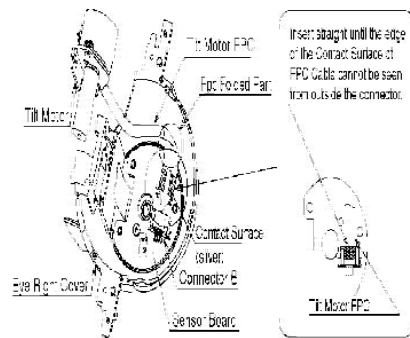
Make sure that the Locating Holes (2 places) of FPC Cable and Locating Holes A and B (2 places) of Sensor Board are overlapped and put into Pin A and B of the Eye Right.

- (2) Once the pin locations are determined, fix the Sensor Board with the Screws (C).



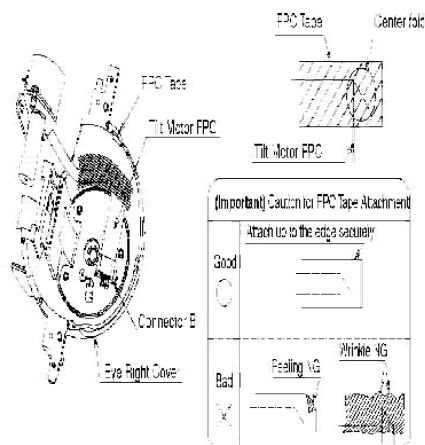
9.4. CAUTIONS FOR PAN MOTOR UNIT ATTACHMENT

1. Insert the Tilt Motor FPC of the Tilt Motor into Connector B of the Sensor Board



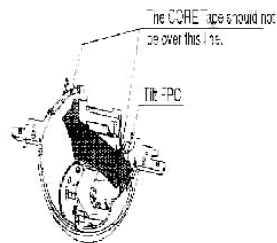
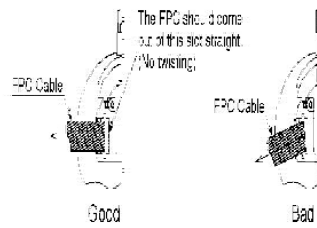
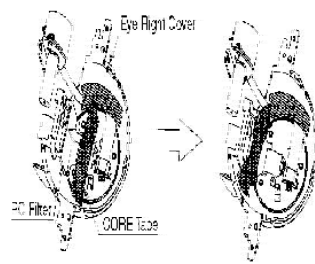
Caution:
Before inserting the FPC into the connector, check its folded part.

2. Attach the Tilt Motor FPC of the Tilt Motor using the FPC Tape on the inside of the Eye Right Cover



Caution:
At the attachment, the fold part of the Tilt Motor FPC should be to the right of the center of the FPC Tape.
Make sure that the Tilt Motor FPC is not removed from the connector.

3. Attach the PC Filter using the CORE Tape to the inside of the Eye Right Cover.

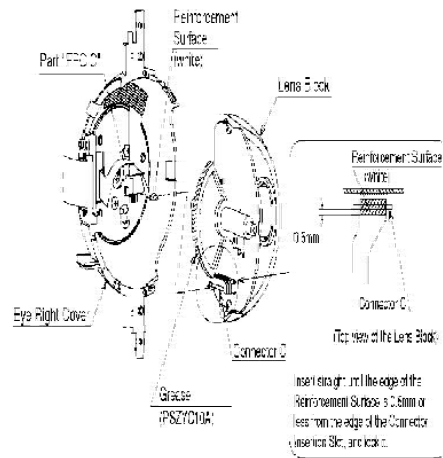


Caution:
When the CORE Tape is attached, it should be attached carefully so as not to be out of the line of the Eye Right Cover.

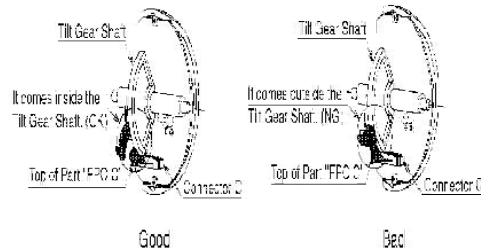
9.5. CAUTIONS FOR CAMERA BOARD ATTACHMENT

1. Attach the Lens Block to the Eye Right Cover.

(1) Form Part "FPC-C" of the FPC Cable as shown below and insert it into Connector C of the Lens Block and lock it.



(2) Attach the top of Part "FPC-C" between the Tilt Gear Shaft and the Lens Block as shown below so that it does not come outside the shaft.



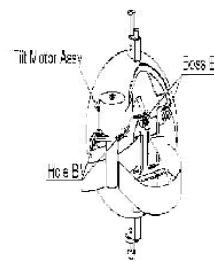
Caution:

Do not touch the lens during attachment of the Lens Block.

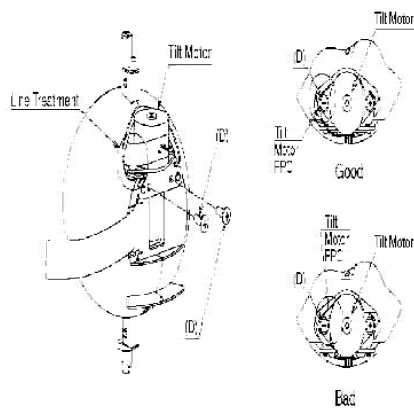
9.6. CAUTIONS FOR TILT MOTOR ATTACHMENT

Attach the Tilt Motor and fix it with the Screws (D).

(1) Turn the Tilt Motor 90 degrees to align the position of Hole B and Boss B and attach it.



(2) Fix Tilt Motor with the Screws (D).

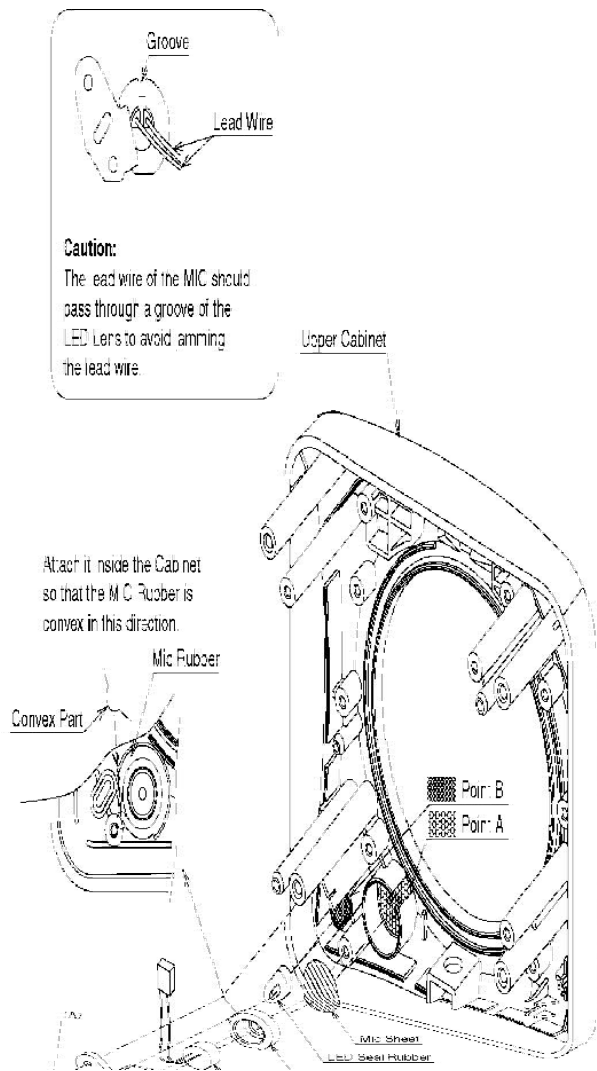


Caution:
The lens treatment of the Tilt Motor FPC or Tilt Motor should not enter the space between the Tilt Motor and the Screws (D).

9.7. CAUTIONS FOR MIC ATTACHMENT

Attach the MIC Sheet to Point A on the Upper Cabinet and attach the LED Seal Rubber to close the hole of Point B.

Then, insert the MIC Rubber, the MIC and the LED Lens and fix them with the Screws (A).

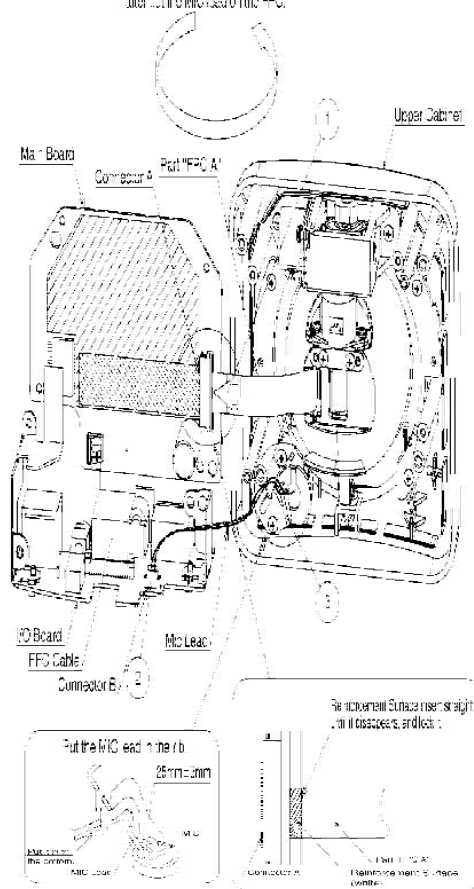


9.8. CAUTIONS FOR MAIN BOARD ATTACHMENT

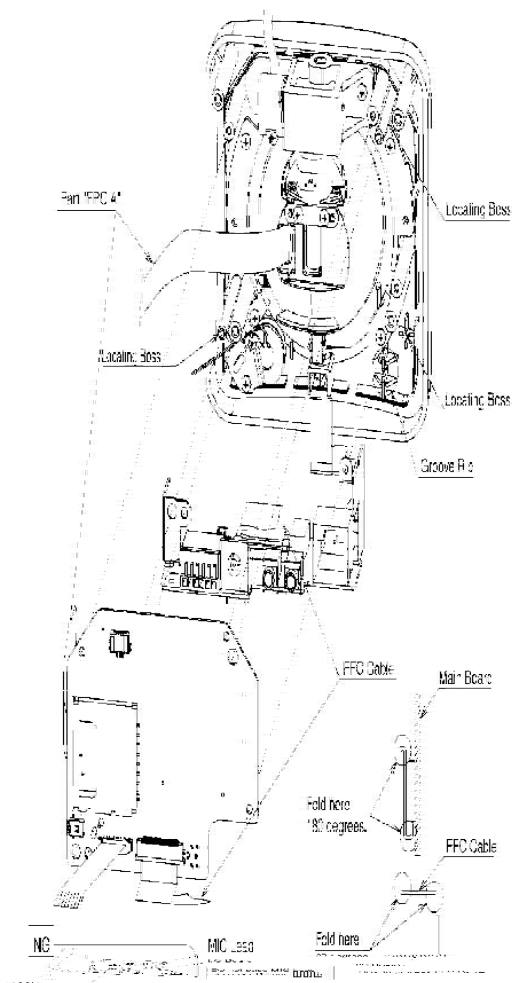
Attach the component that connects the Main Board and the I/O Board with the FFC Cable, to the Upper Cabinet and fix it with the Screw (A).

- (11) Insert Part "FFC A" to Connector A of the component that connects the Main Board and the I/O Board with the FFC Cable and lock it.
- (12) Connect the MIC lead to Connector B of the Board.
- (13) Put the MIC lead in the rib and turn the Main Board and the I/O Board 180 degrees.

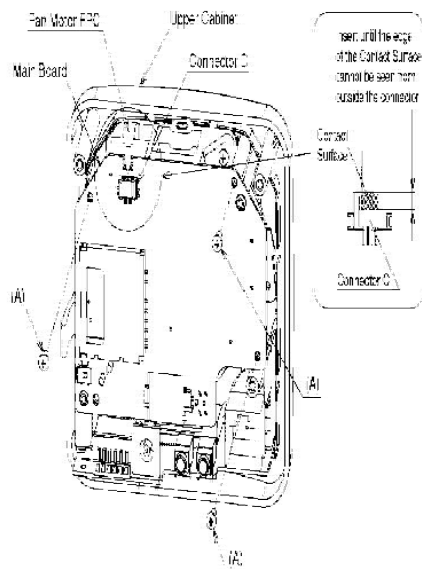
Turn the Main Board and the I/O Board 180 degrees.
after put the MIC lead on the FFC.



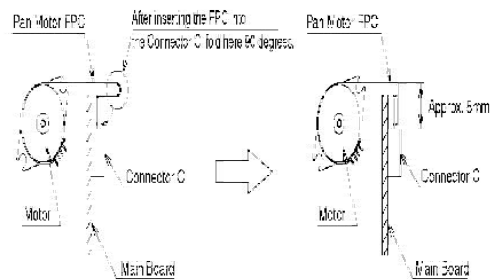
(2) Align the MC Board with the groove rib and locating bosses of the Upper Cabinet and the holes of the Main Board with its bosses.



- (3) Fix the Main Board to the Upper Cabinet with the Screws (A).
- (4) Insert the Pan Motor FPC to Connector C.



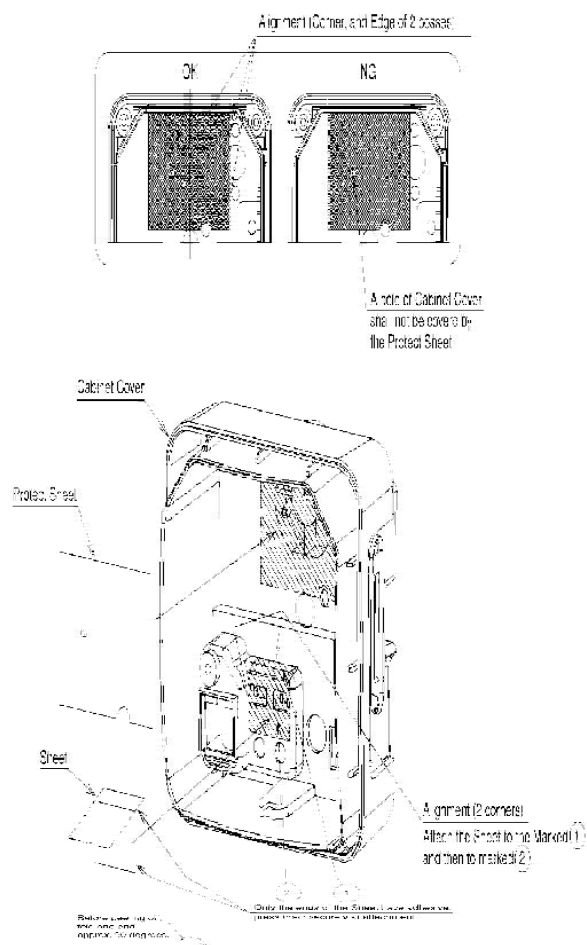
Caution:
How to process the Pan Motor FPC



9.9. CAUTIONS FOR PLASTIC PATS ATTACHMENT

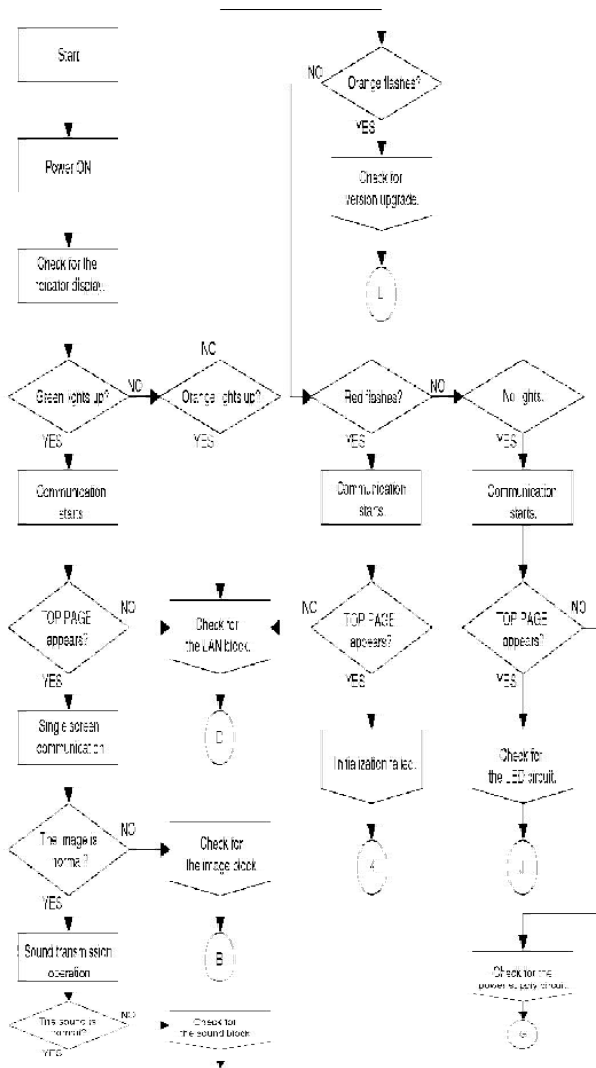
Attach the Sheet and the Protect Sheet to the Cabinet Cover mount the Cabinet Cover on the Upper Cabinet.

Notes: 1) Attach the Sheet to the Marked 1, and then to marked 2.
2) Only the ends of the Sheet have adhesive, press them securely at attachment.

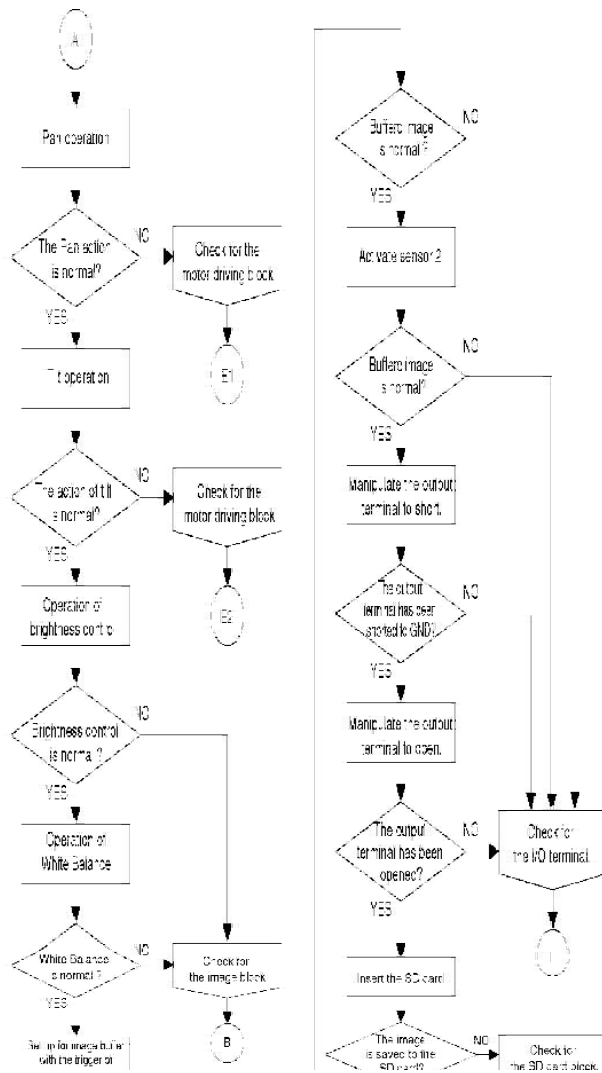


10. TROUBLE SHOOTING

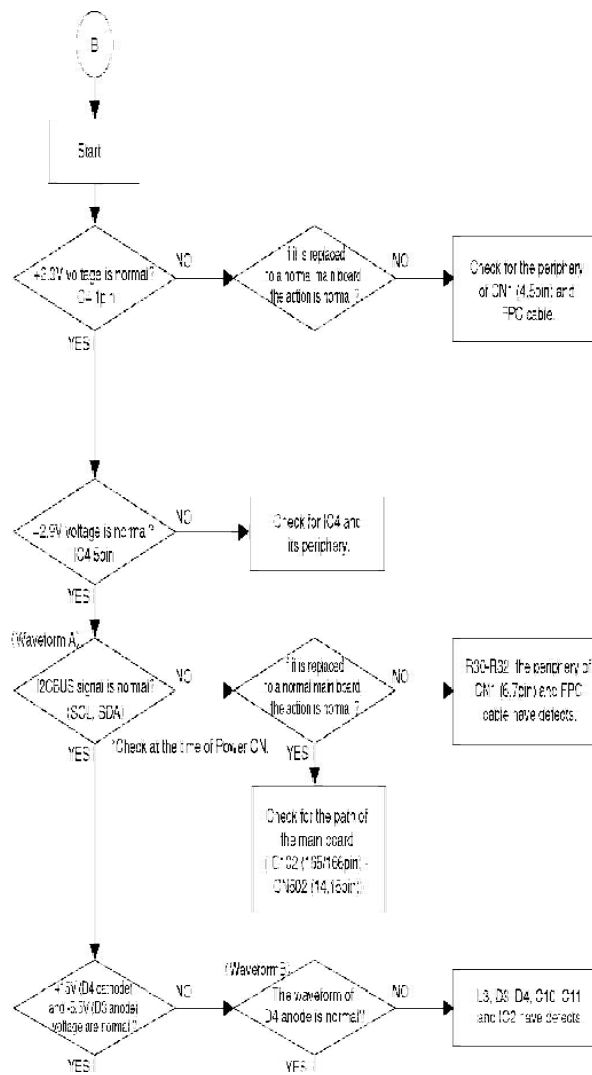
10.1. BASIC OPERATION

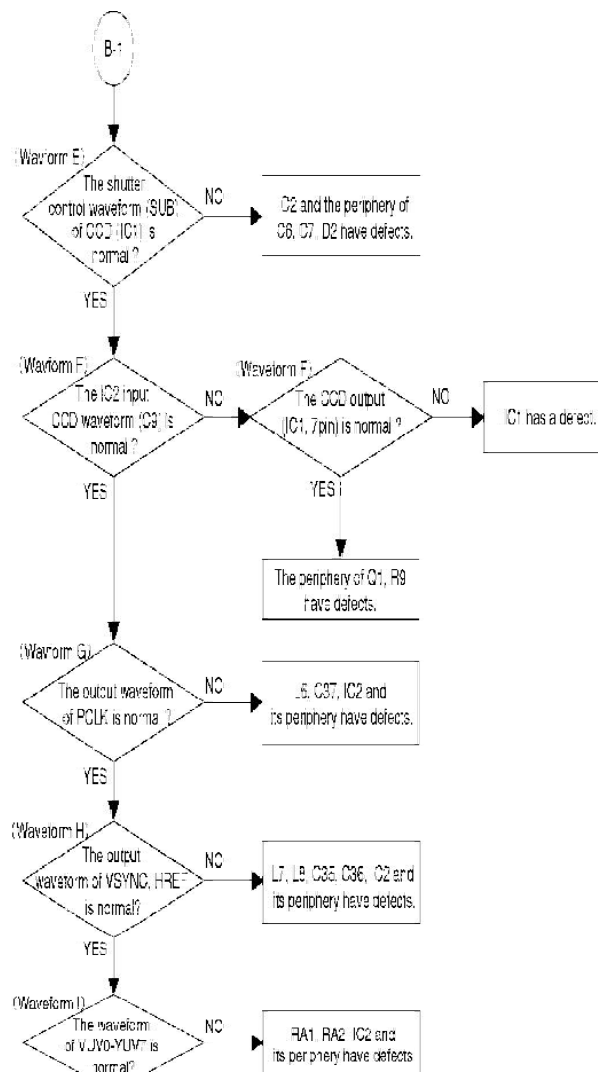


10.2. CHECK FOR OTHER FUNCTION

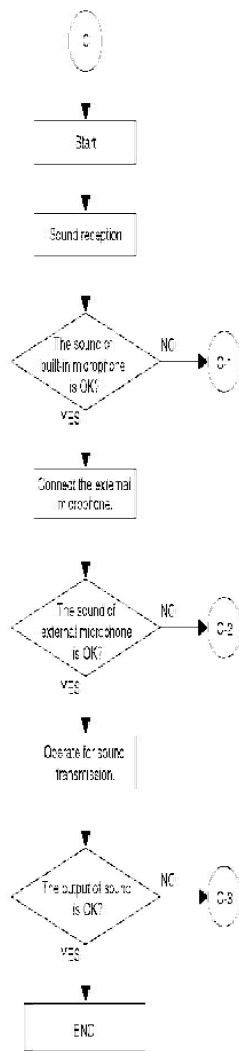


10.3. CHECK FOR SCREEN BLOCK

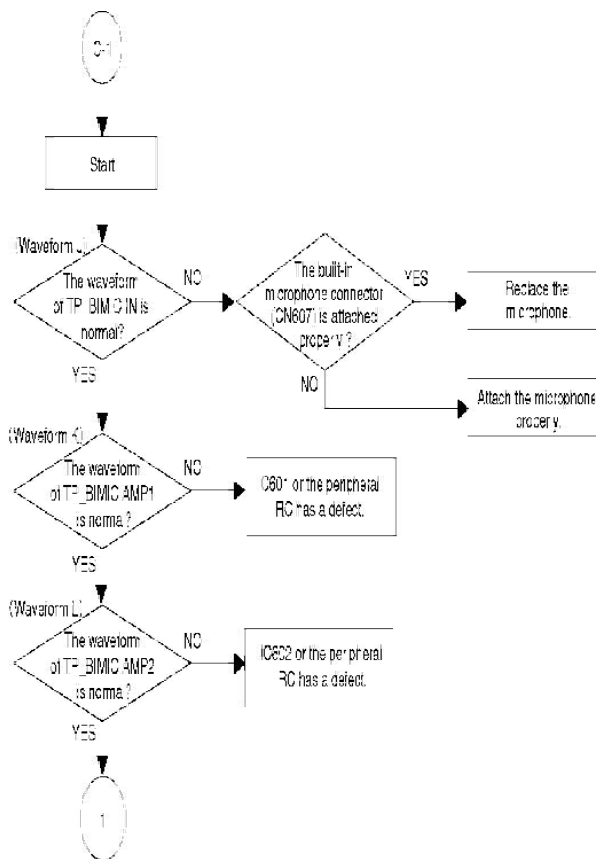




10.4. CHECK FOR SOUND BLOCK



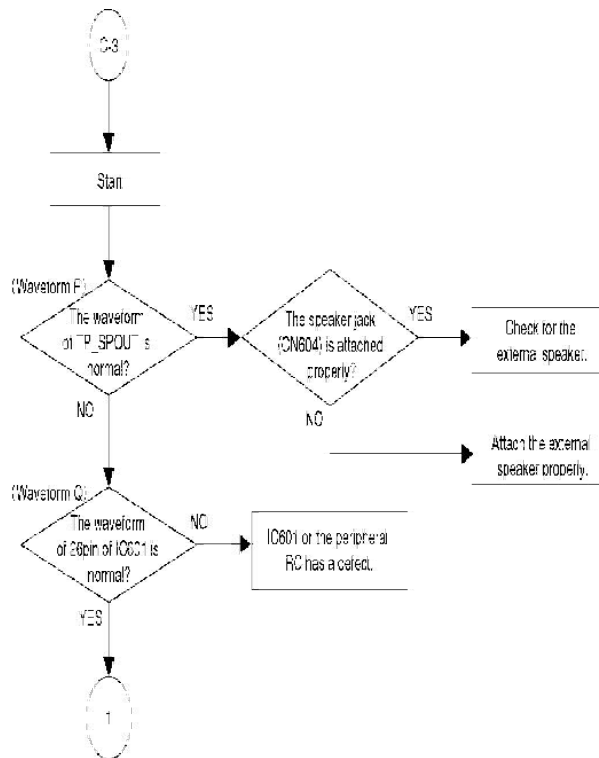
10.4.1. Built-in Microphone



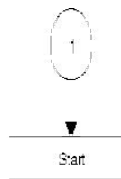
10.4.2. External Microphone



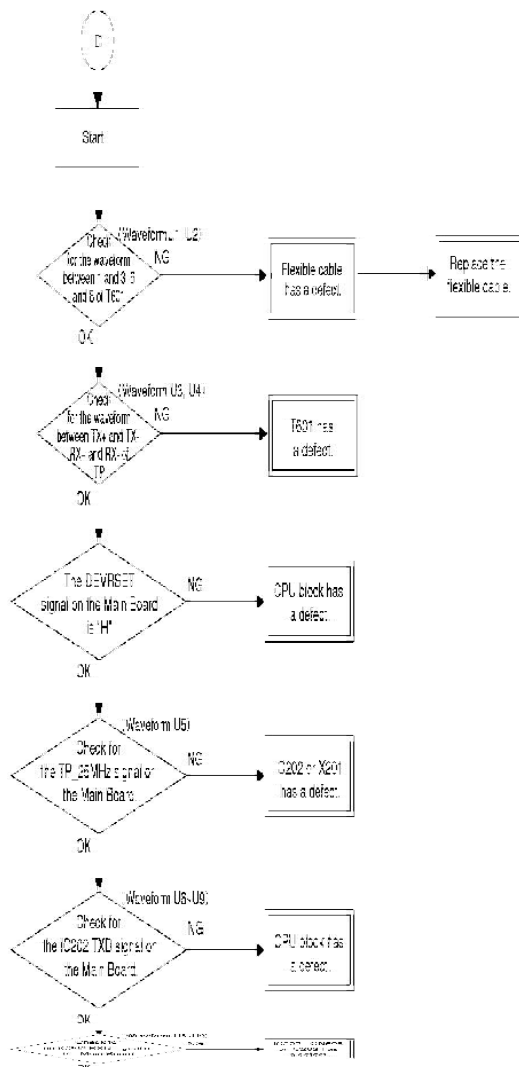
10.4.3. Speaker Output



10.4.4. Common Flow Of Built-in Microphone, External Microphone And Speaker Output

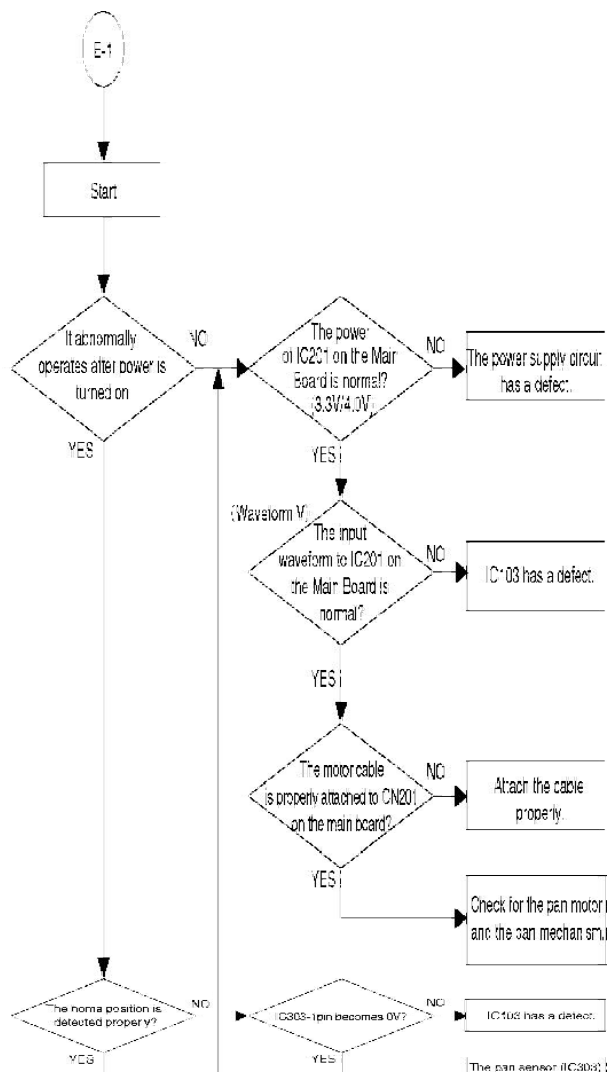


10.4.5. Check For LAN Block

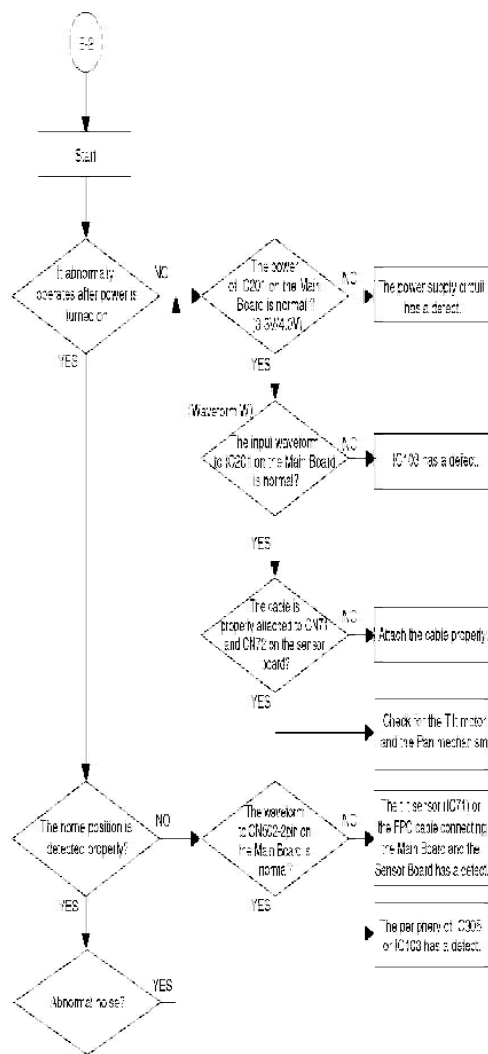


10.5. CHECK FOR MOTOR DRIVING BLOCK

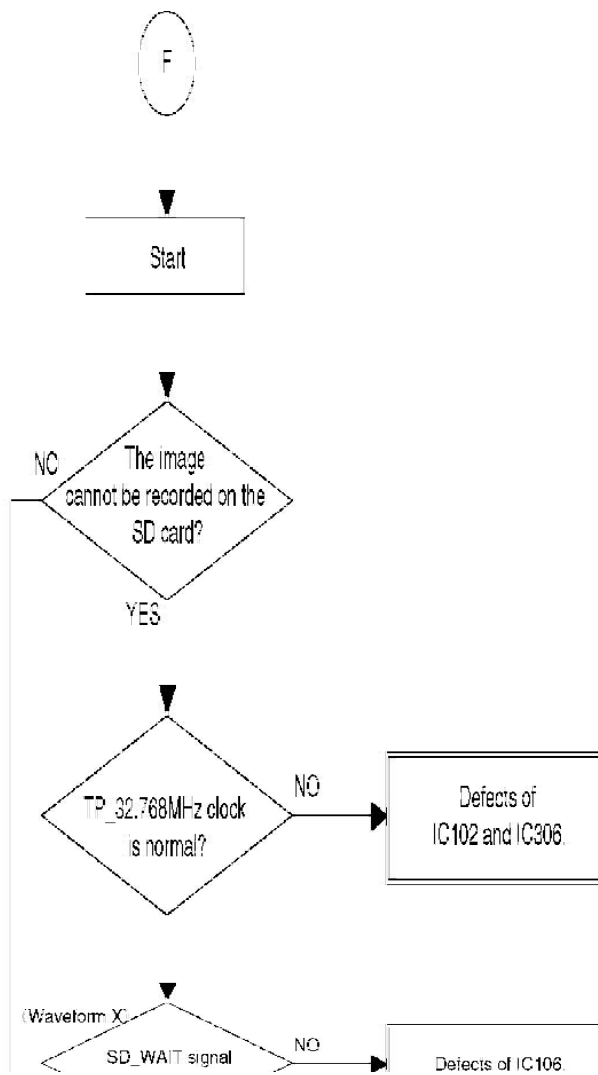
10.5.1. Check For The Action Of Pan

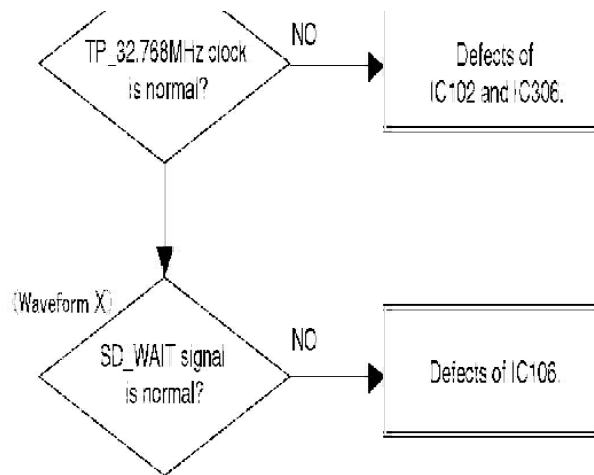


10.5.2. Check For The Action Of Tilt

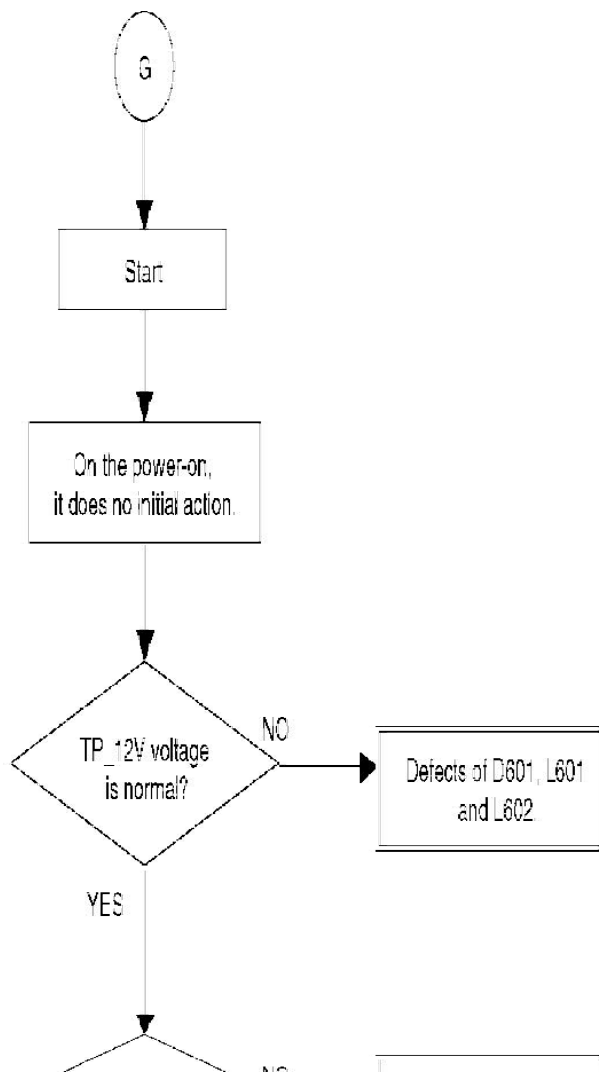


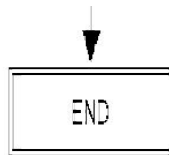
10.6. CHECK FOR SD CARD



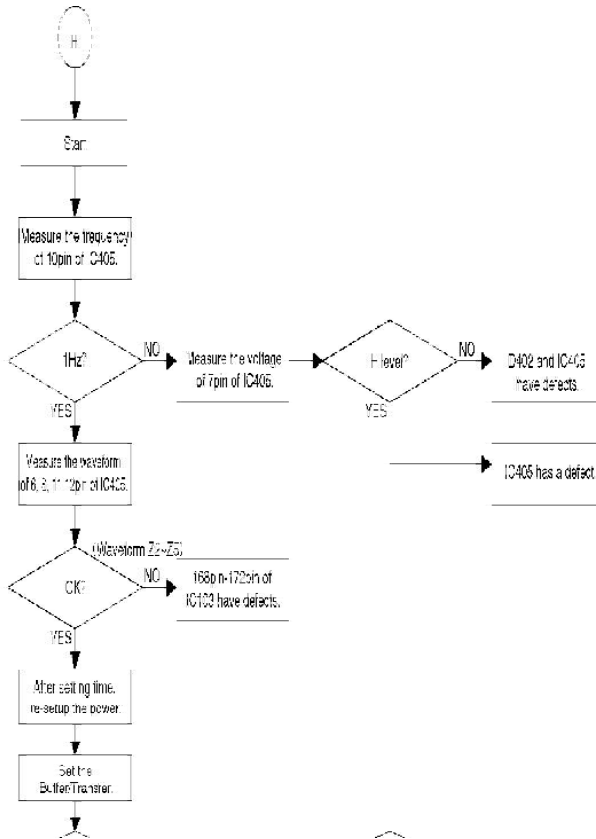


10.7. CHECK FOR POWER SUPPLY BLOCK

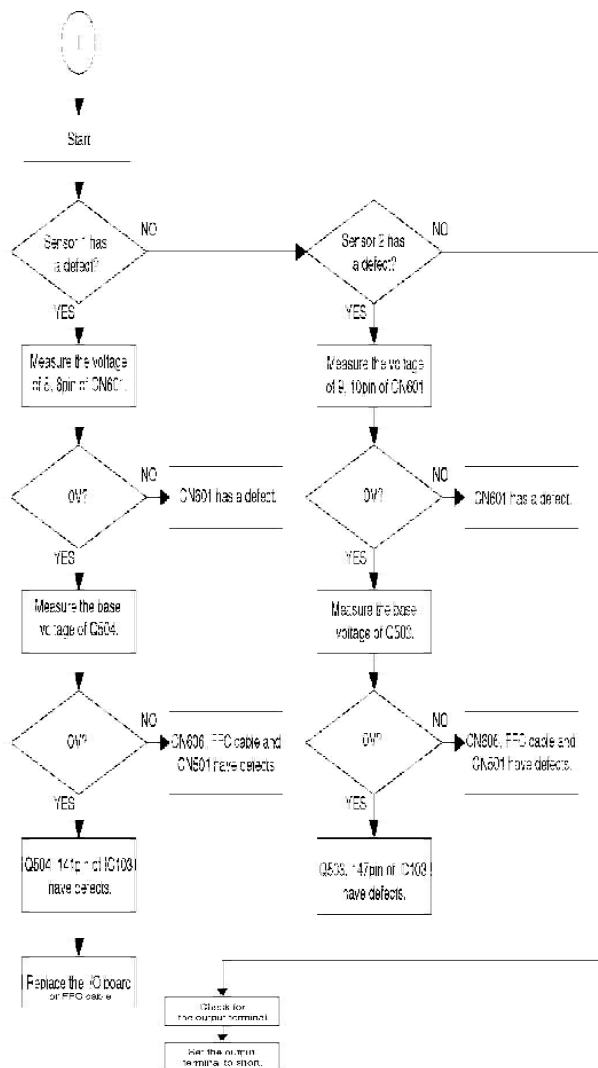




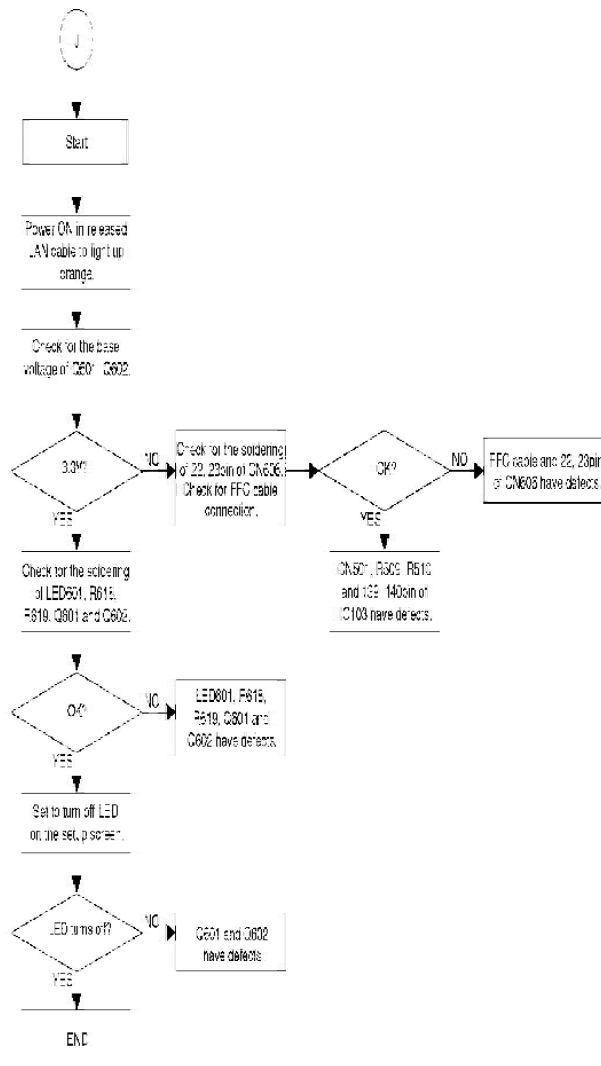
10.8. CHECK FOR RTC CIRCUIT



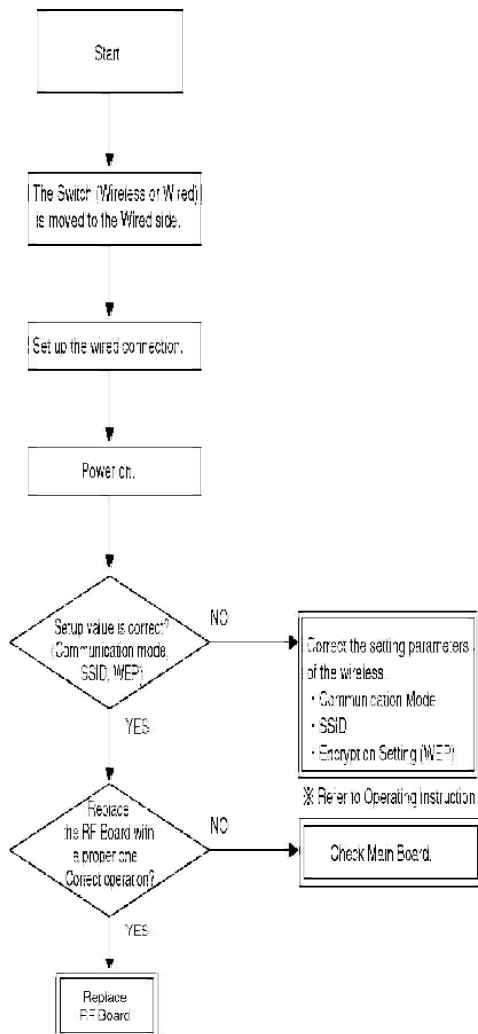
10.9. CHECK FOR I/O TERMINAL



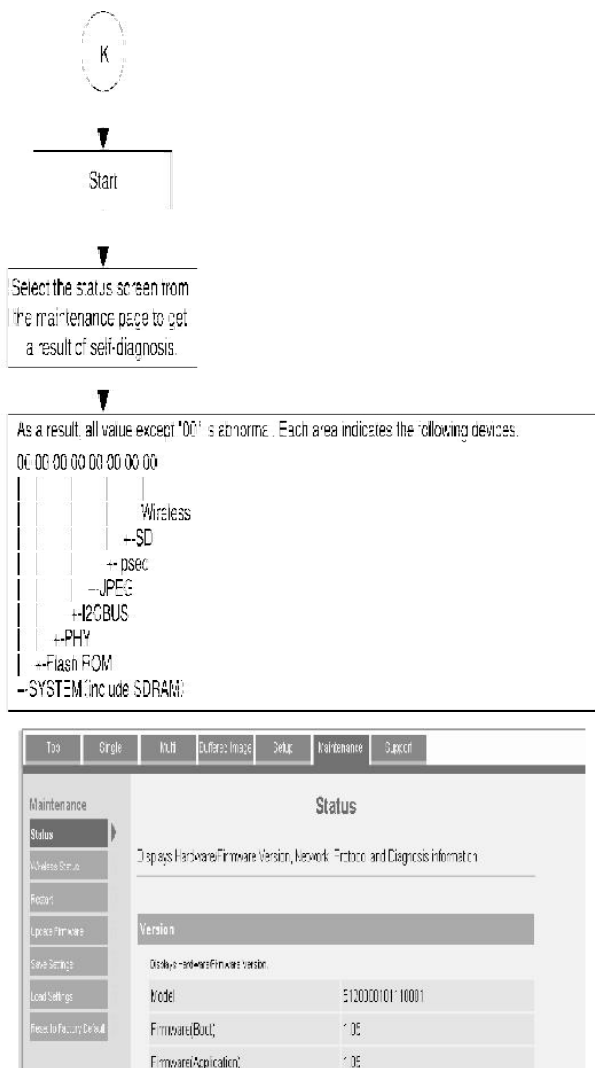
10.10. CHECK FOR LED CIRCUIT



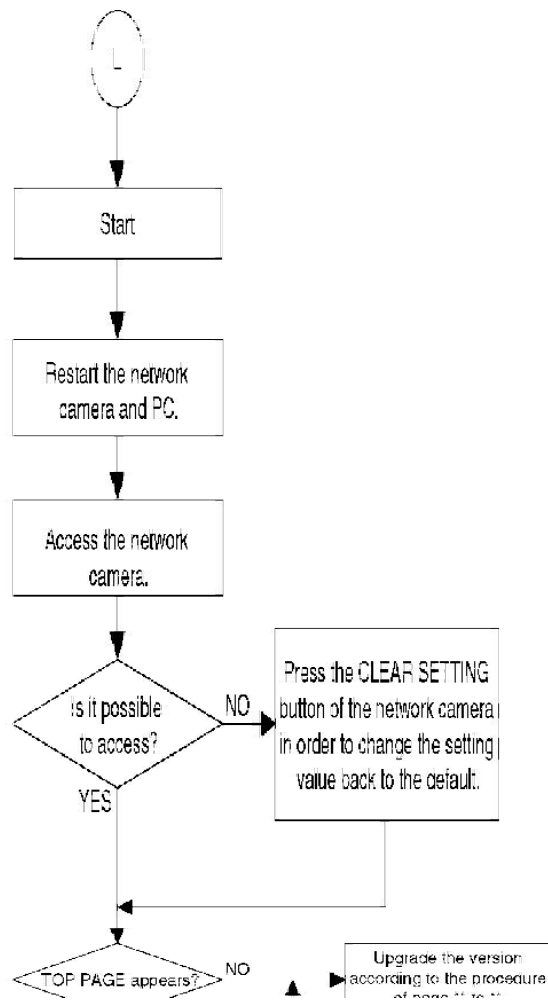
10.11. RF BLOCK



10.12. CHECK FOR INITIALIZATION



10.13. CHECK FOR VERSION UPGRADE



10.14. IN CASE WHERE THE MAIN BOARD IS REPLACED AND A NEW MAC ADDRESS LABEL IS USED

Rewrite the MAC Address of the RF board

1. Connect a LAN cable and turn on the power after replacing the main board (after a new MAC has been written to the main board).
2. Access the Commandexec Screen and perform the following command.
setblock wlan e3 01 12
Response OK
3. Access the Commandexec Screen and perform the following command after more than 30 seconds after re-supply of power.
setblock wlan e1 10 4d4143206368616e6765
Response OK
4. Press the Factory Default Reset button.
* Do not turn the power off during execution of work.
5. Renew the MAC Address label.

10.15. IN CASE WHERE THE RF BOARD IS REPLACED

Rewrite the MAC Address of the RF board.

1. Connect a LAN cable and turn on the power after replacing the RF board (after a old MAC has been written to the main board).
2. Access the Commandexec Screen and perform the following command.
setblock wlan e3 01 12
Response OK
3. Access the Commandexec Screen and perform the following command after more than 30 seconds after re-supply of power.
setblock wlan e1 10 4d4143206368616e6765
Response OK
4. Press the Factory Default Reset button.

* Do not turn the power off during execution of work.

11. THE WAY OF THE INITIALIZE

11.1. FACTORY DEFAULT RESET BUTTON

The camera has a Factory Default Reset button on the rear.

Pressing the Factory Default Reset button resets the camera to factory default.

If you lose your user name and password, use this button to reset the camera.

- **Press the Factory Default Reset button for 1 second when the camera is on.**
- **The indicator blinks orange, and turn off for 10 seconds.**
- **Do not turn off the camera until the indicator lights green.**

Note:

- **Internal clock will not be reset, but the time format will return to AM/PM mode. Set it again.**
- **All buffered images are deleted when resetting the camera to factory default.**
- **The reset operation takes about 1 minute.**

11.2. RESETTING THE CAMERA TO FACTORY DEFAULT

This feature will be executed and all camera settings reset to factory default directly after the Execute button is clicked.

1. Click [Reset to Factory Default] on the Maintenance page.
2. Click [Execute].

- **The indicator blinks orange, and turn off for 10 seconds.**
- **All camera settings (user name, password, IP address, subnet mask etc.) are reset to factory default.**
- **If the camera is reset to factory default, the network connection mode changes to [Automatic Setup]. Reconfigure the camera seeing the Getting Started.**

Note:

- **Internal clock will not be reset, but the time format will return to AM/PM mode. Set it again.**
- **Please refer to Operating Instructions for default values.**
- **Pressing FACTORY DEFAULT RESET button resets the camera to the factory default.**
- **All buffered images are deleted when resetting the camera to factory default.**
- **The reset operation takes about 1 minute.**

- Do not turn off the camera during the reset operation.

12. BLOCK DIAGRAM

13. CIRCUIT DESCRIPTION

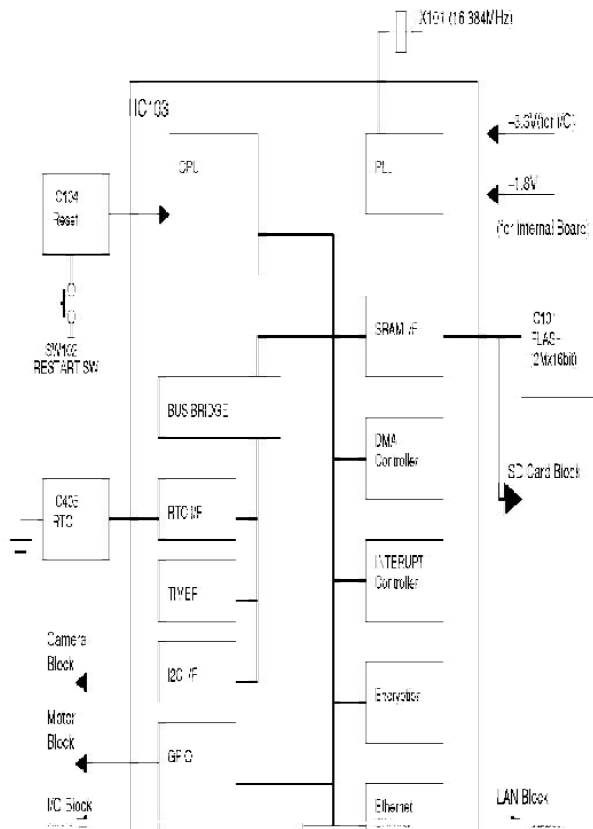
13.1. CPU PERIPHERAL BLOCK

- The IC103 is a system LSI for a network camera containing the CPU
- The power supply voltages are +3.3V (I/O) and +1.8V.
- The CPU is a 32-bit RISC CPU and performs mainly hardware control, TCP/IP protocol processing and applications such as http and FTP.
- The clock setting is 65.536MHz, which is the four times of 16.384MHz oscillation in the X101 by PLL.
- There are two types of external bus: the General-purpose bus through SRAM I/F and the bus for SDRAM only.
- The General bus is connected to a Flash Memory for program storage.
- The capacity of the Flash Memory (IC101) is 32Mbit (2Mx16bit); the program, the setting information for the network camera and the MAC address are stored.
- The SDRAM (IC105) is 64Mbit (4Mx16bit) and used for the CPU processing work, the communication data storage and the sound and image data storage.
- The RESET IC (IC104) monitors the power supply voltage, detects the rising edge of +3.3V and generates the Hardware Reset Signal.
- The RESTART SW (SW102) is connected to the RESET IC for manual reset and the hardware is reset by pressing the SW.
- The IC405 is a RTC (Real Time Clock) and is used for the time setting of the image transfer. It is backed up at power-off by a lithium battery (BAT401). The I/F with the CPU has a dedicated controller. (5-line I/F)
- The Encryption block inside the IC103 is an Ipsec communication encryption engine and is used at the software protocol processing.

Signal Flow

1. When a request from the PC is received through LAN, the CGI command is analyzed at the CPU and the requested image/sound data are generated.
2. The JPEG image and sound data accumulated on the SDRAM are formed in IP packet by the protocol processing.

3. If the Ipsec is not encrypted, it is sent without change. If it is encrypted, this is carried out in the Encryption Block and a header is added to send to the Ethernet MAC part.



13.2. CAMERA BLOCK

Basic Function

<Image System>

The subject image from a lens is photoelectric-converted by CCD (IC1). The CCD output analog image signal is input to the DSP (IC2). After the A/D conversion after analog preprocessing and the specified Signal Processing, it is output as a YUV 8bit signal.

<Power Supply System>

In the power supply system, +3.3V is input from the Main Board. +2.9V is generated by a regulator and the Power Supply for CCD of +15 and -5.5V is generated by the DC-DC converter contained in the DSP.

1. CCD (IC1)

Operating Voltage: +15V, -5.5V

Effective Number of Pixels: 659 x 494

Image Size: 1/4 type

Color Filter: Original Colors RGB

Package: 14pin Plastic DIP

The CCD is driven by the horizontal driving signal (H1, H2, RG) and the vertical driving signal (V1, V2A, V2B, V3) output from the DSP (IC2).

The subject image focused by a lens is converted to electrical signals, read out by the driving signal and input to the DSP through IC1(pin 7) to Q1.

2. DSP (IC2)

Characteristics: AFE, V-driver, 3-chip SEP (System Embedded Package) of the Signal Processing DSP

Power Supply: +3.3V, +2.9V

Function: CCD Drive, CDS, AGC, A/D, Luminance Signal Processing (gamma correction, outline correction etc.)

Color Signal Processing (White Balance, Matrix etc.), Automatic flaw correction AE/AWB/AGC control by the Signal Processing DSP microcomputer, Fluorescent lamp flicker-free

Package: 312pin Ceramic BGA

Clock Frequency: 24.5454MHz

<AFE Chip>

The specified sampling is performed in the CDS circuit inside the AFE chip and the noise of the CCD output signal is removed. After it is adjusted to the specified level according to the instruction from the Signal Processing DSP in the GCA circuit, it is converted to 10-bit digital signal by the A/D converter inside the AFE chip and input to the Signal Processing DSP.

Power (+3.3V) is supplied through L4 and L5 after the ON/OFF control by the Signal Processing DSP.

<V-driver Chip>

Generates the CCD power supply of +15V and -5.5V from the input of +3.3V by the external L3, D3, D4, C10 and C11.

Generates 3-values V-drive signal for CCD driving by a timing signal from the Signal Processing DSP.

<Signal Processing DSP Chip>

Processes the AFE output signal, and outputs the Analog Y signal and C signal. Outputs the CCD driving signal.

The built-in microcomputer performs the AE (Auto Exposure) and AWB (Auto White Balance) processing, and the Read/Write for each control and setting. The Read/Write for each setting to the IC is performed by the Main CPU (IC102) on the Main Board on I2CBUS (SDL, SDA).

=Image Signal Processing=

The 10bit CCD output signal from the AFE chip is processed as follows:

1. The outline in the horizontal and vertical directions is corrected
2. The characteristics of gray-scale are corrected by gamma correction.
3. The white balance is corrected.
4. The RGB signal is converted to the luminance signal (Y signal) and the color difference signal (R-Y (V), B-Y (U) signal).
5. The color saturation and phase are adjusted by color difference matrix.
6. It is output as YUV 8bit signal.

=CCD Driving Signal and Timing Signal Generation=

CCD Driving Signal [For horizontal (H1, H2, RG), vertical (V1, V2A, V2B, V3)], Timing Signal [HREF Signal, Vsync Signal, and AFE (DS1, DS2, ADCLK, CPOB)] etc. are output. The timing of these signals is set by a serial signal from the CAMERA CPU.

=AE Control Signal Generation=

Based on the luminance signal level detected by the image signal processing area, the AGC gain control and the exposure time control to CCD of the AFE chip (by CCD shutter speed control signal (SUBA Signal (IC2(pin V6) --> C7 --> C6 --> IC1(pin 10))) are performed.

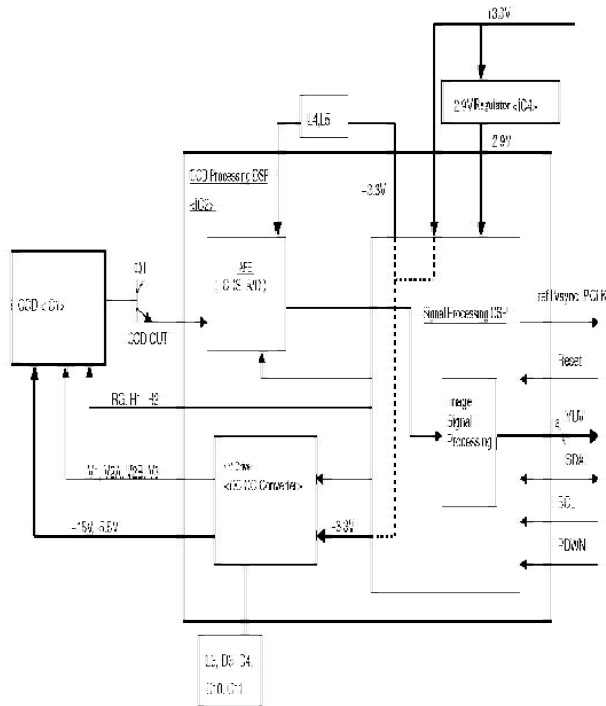
3. Clock

Generated on 24.5454MHz crystal oscillator (X1) on the board.

4. Regulator (IC4)

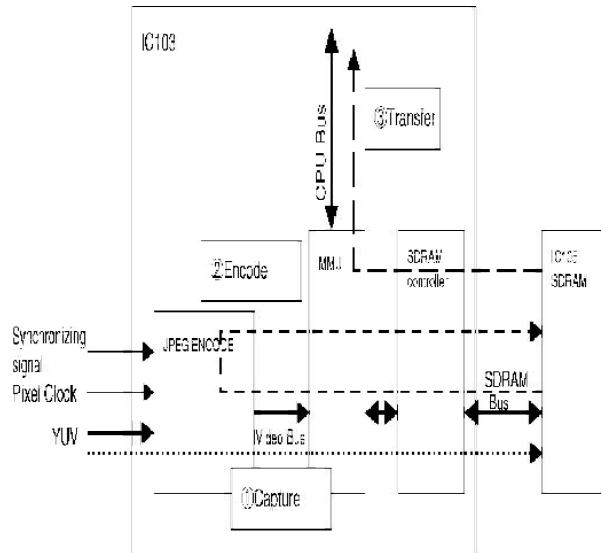
Input +3.3V, Output +2.9V

Package: 5pinSOP



13.3. JPEG BLOCK

- The IC103 is a system LSI for a network camera containing the CPU.
- The JPEC Encode Circuit, the Memory Management Unit(MMU) and the SDRAM Controller are built into this LSI.
- The image data(YUV) inputted from a Camera Block is captured to the SDRAM through the JPEG Encode Block, the MMC and the SDRAM Controller. (1)
- The captured YUV data are inputted to the JPEG Encode Block again and the JPEG processing is performed here. The compressed encode data are stored to the SDRAM. (2)
- A header is added to the encoded JPEG data by a direction of the CPU and it is transferred to a network after a protocol processing. (3)



13.4. SOUND BLOCK

External Microphone Jack (CN603)

Used with the external microphone.

Speaker Jack (CN604)

Used when connecting a speaker with a built-in amplifier, when the sound is output from a camera.

Microphone Detection (Q603)

When the external microphone plug is not inserted, pins 3 and 2 of the Microphone Jack (CN603) are short-circuited and a base current is supplied to Q603 through R603, R632 and R629 so that the Q603 goes ON and a collector (MIC_S signal) goes LOW. Alternatively, when the microphone plug is inserted, pins 3 and 2 of the CN603 become open so that the Q603 goes OFF and the MIC_S signal goes HIGH. From this signal, the CPU detects the microphone status.

The CPU turns the microphone SW on and off in the PCM Codec (IC601) for the external or the built-in microphone, as appropriate.

ALC Amplifier (IC602: For the built-in microphone, IC603: For the external microphone)

Power Supply: 3.3V

Amplifier for Auto Level Control

PCM Codec (IC601)

Power Supply Voltage: 3.3V

Clock Frequency: Contains a built-in PLL function and generates a clock from the BCLK (256 KHz).
Contains an amplifier, LPF, gain adjustment, AD/DA converter, host I/F, PCM serial I/F and speaker output function.

Flow of Sound Signal

[Microphone sound]

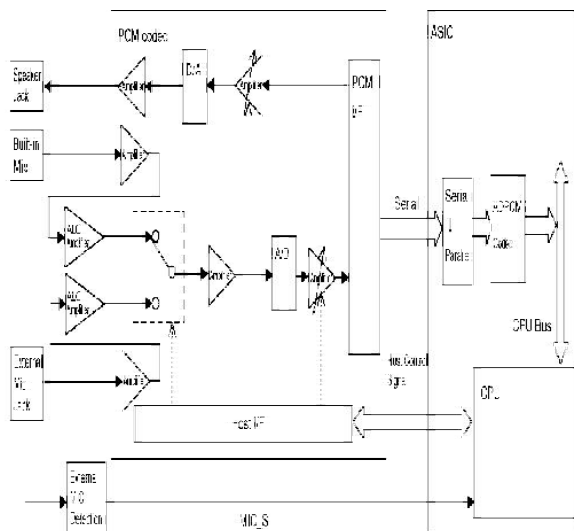
- 1. The sound data input from pin 1 of the built-in microphone connector (CN607) is amplified by the amplifier in the PCM Codec (IC601) and the ALC (IC603), then input as the built-in microphone to the PCM Codec (IC601) again.**
When the level of the input sound signal is more than the specified value, the gain is changed and the output signal level is kept constant at the ALC (IC603). Sound distortion is controlled when the input is excessive.
- 2. When the external microphone is attached to the microphone jack (CN603), the sound signal input from pin 2 of the CN603 is amplified by the amplifier in the PCM Codec (IC601) and the ALC (IC602), then input as the external (microphone) to the PCM Codec (IC601) again**
The ALC (IC602) works in the same way as the IC603.
- 3. In the PCM Codec (IC601), after the sound signal is switched between the built-in microphone and the external microphone by a register setting from the host, amplification, AD conversion and gain adjustment are performed.**
The sampling frequency of the A/D conversion is 8kHz and it is converted to the PCM in the format of 8bit and law. Then, 64kbps data are output to the ASIC (101) through the Serial I/F.
The data transfer of the Serial I/F is BCLK (256 kHz).
- 4. The data compression of 32kbps is performed in the ADPCM Block of the ASIC (101) and the data transferred as sound data.**

[Speaker Sound]

- 1. The ADPCM sound data are sent from the PC and, after data decompression in the ADPCM block of the ASIC (101), the data are transferred as the sound data of 64kbps to the PCM Codec (IC601)**

through the Serial I/F.

2. After the μ law to linear conversion, amplification and DA conversion, they are output to pin 2 of the speaker jack (CN604) as sound output signal in the PCM Codec (IC601).



13.5. LAN BLOCK

Composed of the IC103 (CPU), the IC202 (ETHER-PHY), the T601 (Transformer) and the CN605 (RJ45). The T605 (Transformer) obtains isolation between the Set and the Ethernet. The IC103 (CPU) and the IC202 (ETHER-PHY) are connected by a signal called MII Bus and it makes Ether net data sending and receiving possible.

Sending

The electrical signal sent from the IC103 is converted to Ethernet data at the IC202 and sent from the CN605 through the T601.

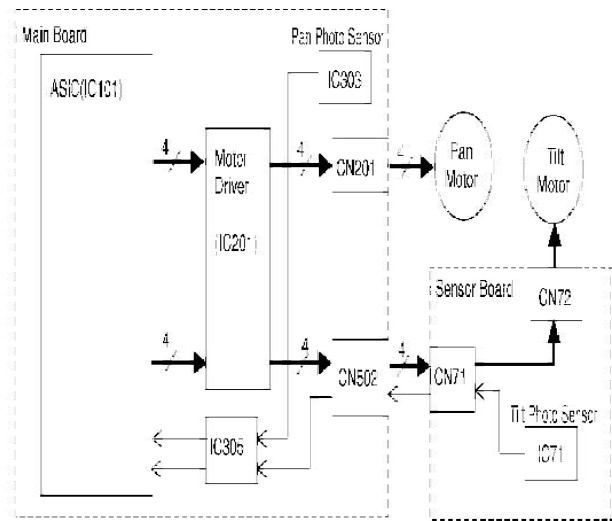
Receiving

The Ethernet data received from the CN605 is converted to electrical data at the IC202 and received to the IC103.

13.6. MOTOR DRIVING BLOCK

The pan tilt is performed, as the ASIC (IC101) mounted on the Main Board controls the Motor Driver (IC201). The home position of the pan tilt operation is detected by the Pan Photo Sensor (IC303 on the

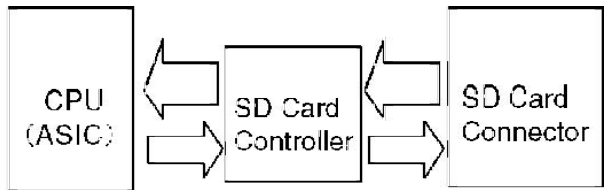
Main Board) and the Tilt Photo Sensor (IC71 on the Sensor Board).



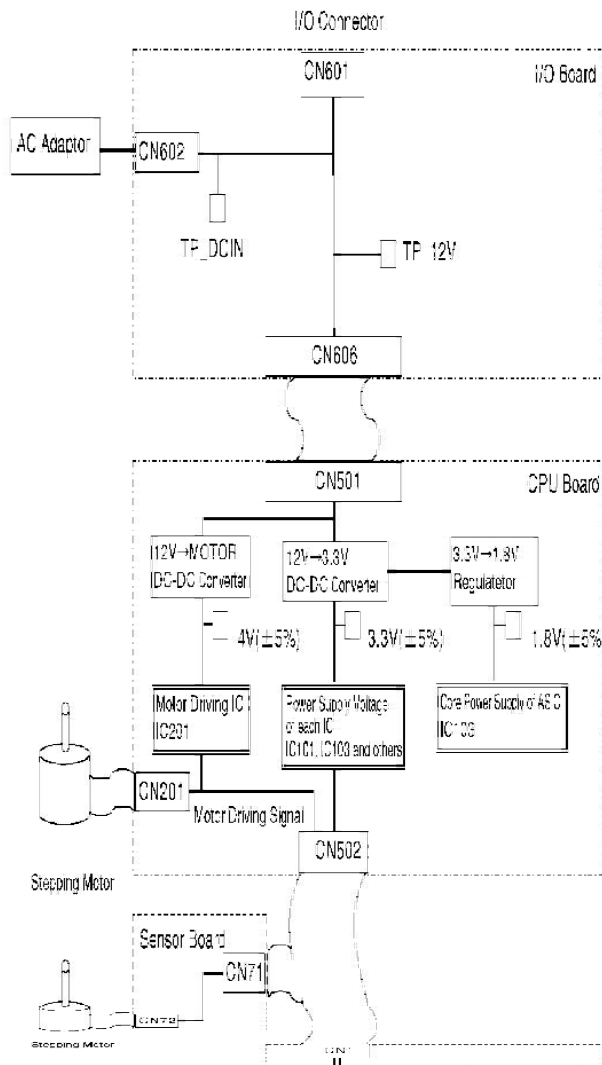
13.7. SD CARD BLOCK

The data written on the SD Card are read out by the SD Card Controller and divided into IP Packets in the ASIC to be sent.

The JPEG-compressed image data from the ASIC are written on the SD Card by the SD Card Controller.



13.8. POWER SUPPLY BLOCK

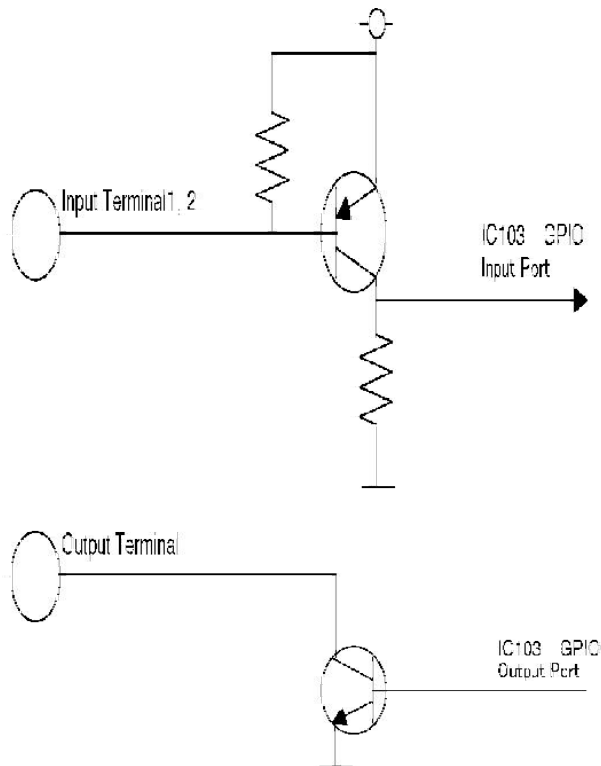


13.9. OTHERS

13.9.1. I/O Terminal

- The Input terminal has two systems; both of them are connected to the Input Port of the IC103 GPIO.
- Due to Internal Pull-up Resistance, the PNP Transistor (Q504, Q503) on the following level is usually in the OFF state and the Input Port connected to the collector is at L level.
- If the terminal is short-circuited with the GND or the signal of L level is input, the PNP Transistor goes ON and the Input Port goes to H level.

- The CPU checks the state of this port regularly to detect a change in this signal.
- The Output terminal is controlled by the Output Port of the IC103. When the Port output is L, the transistor (Q501) on the following level is OFF and, when the output is H, the transistor is ON. This transistor has open collector output and it controls external equipment via external pull-up.



13.9.2. Clear Setting SW

- The Clear Setting SW (SW101) is connected to the Input Port of the GPIO. It is usually at H level and goes to L level, when the SW is pressed.
- The CPU monitors this Input Port regularly and, if it detects that this SW is pressed longer than a specified period, the setting values other than the RTC are returned to factory settings.

13.9.3. LED

- The LED (LED601) has two-color LEDs (red and green). When the transistor (Q601, Q602) connected to each LED is turned ON/OFF via the Output Port of the IC103, it controls the ON/OFF of the LED.

13.10. RF BLOCK

- Antenna

- Receiver

The receiving signal from the antenna is input to the RFIC (IC502) after being passed through the Antenna Switch (IC506) and amplified at LNA (Low Noise Amp). The RFIC (IC502) incorporates the LNA (Low Noise Amp), the Mixer for Frequency Converter and the Synthesizer generating the Receiving Local Signal. At the RFIC (IC502), the input signal is separated into the baseband signals of the In-Phase(RxI) and Quadrature (RxQ) to output.

The baseband signal is input to the CPU&MAC/BBIC(IC601) and, after A/D conversion, the data are regenerated.

- Transmitter








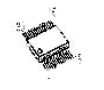









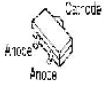




The Data Frame (Data Packet) generated at the built-in MAC Part by the CPU&MAC/BBIC (IC601) is converted to the In-Phase (TxI) and the Quadrature (TxQ) and input to the RFIC (IC502).

At the RFIC (IC502), it is converted to the RF Signal of the transmitting frequency band.

After processing including impedance conversion, level adjustment and control of the unnecessary frequency component, it is sent from the antenna through the Antenna Switch (IC506).

The RF Signal from the Power Amp (IC505) is fed back to the RFIC (IC502) after level detection. The gain is adjusted in the RFIC (IC502) for a constant transmitter output level.

14. TERMINAL GUIDE OF ICS, TRANSISTORS AND DIODES

 PSWHCM371A	 DCUBAF30054E	 CDB00001114	 CDBE0000291	 C9ABPG000129
 DCUBAB000036 C9DBAFZ00054 AN# 120 MS	 CDBE0000020	 C1C900001622	 CDB00000357	 CDBE0000004
 M95774	 C1C300001918	 CDB00000039	 CDB000001822	 RF-352
 B314A0000000	 B1C-00000000	 MA3080 VA7-19WK WA-43A	 MA111	 MA700
 PCVTDTC140E E-GBGF000002 PCVTDTA145EU B1ABCF000000 PCVTDTA1437U	 BSAKB00000002			

15. HOW TO REPLACE A FLAT PACKAGE IC

Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs that have more than 100 pins.

15.1. PREPARATION

- PbF (: Pb free) Solder

- Soldering Iron

Tip Temperature of 700°F ± 20°F (370°C ± 10°C)

Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.

- Flux

Recommended Flux: Specific Gravity 0.82.

Type RMA (lower residue, non-cleaning type)

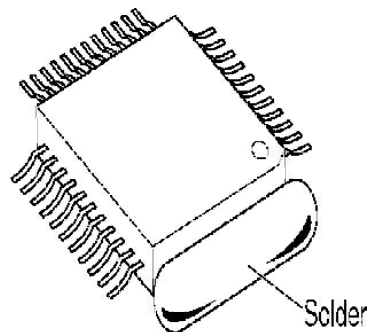
Note: See [ABOUT LEAD FREE SOLDER \(PbF: Pb free\)](#) ().

15.2. REMOVAL PROCEDURE

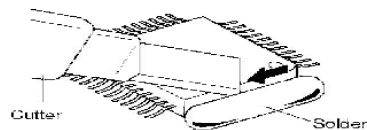
1. Put plenty of solder on the IC pins so that the pins can be completely covered.

Note:

If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



2. Make a few cuts into the joint (between the IC and its pins) first and then cut off the pins thoroughly.

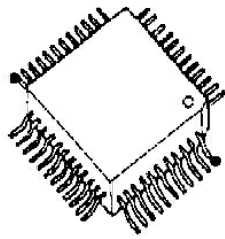


3. While the solder melts, remove it together with the IC pins.

When you attach a new IC to the board, remove all solder left on the land with some tools like a soldering wire. If some solder is left at the joint on the board, the new IC will not be attached properly.

15.3. INSTALLATION PROCEDURE

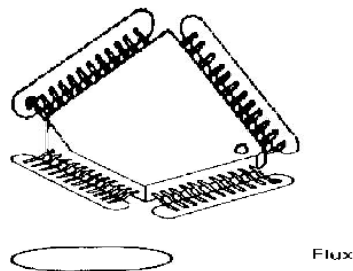
1. Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.



● - - - - - Temporary soldering point.

Be certain each pin is located over the correct pad on the PCB.

2. Apply flux to all of the pins on the IC.

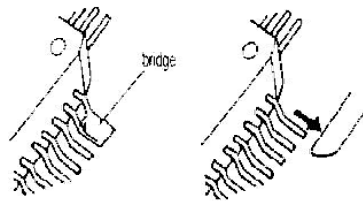


3. Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the tip so that it flows under the pins as they are heated.

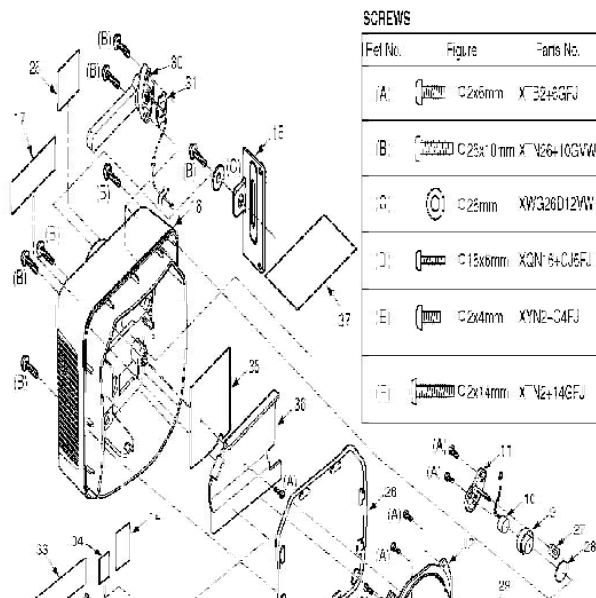
15.4. REMOVING SOLDER FROM BETWEEN PINS

1. Add a small amount of solder to the bridged pins.

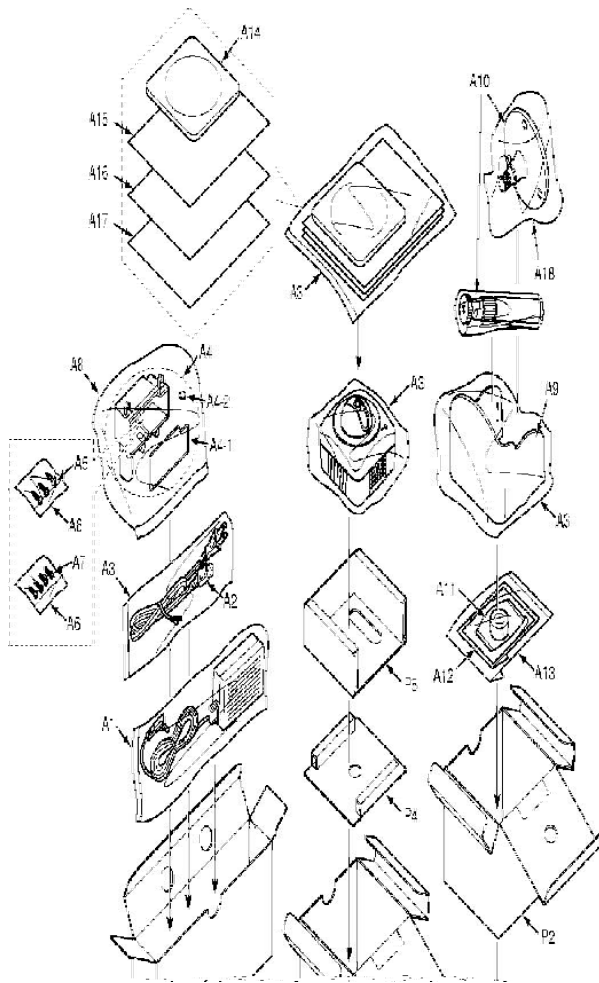
2. With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.



16. CABINET AND ELECTRICAL PARTS LOCATION



17. ACCESSORIES AND PACKING MATERIALS



18. REPLACEMENT PARTS LIST

Note:


1. RTL (Retention Time Limited)

The marking (RTL) indicates that the Retention Time is limited for this

item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability depends on the type of assembly and the laws governing parts and product retention. At the end of this period, the assembly will no longer be available.

2. Important safety notice

Components identified by the  mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms (Ω), k=1000 , M=1000k

All capacitors are in MICRO FARADS (μ F), p= (μ F)



*Type & Wattage of Resistor

Type		
ERO-Solid	ERO-Meta Film	FOR-Carbon
ERO-Carbon	ERS-Metal Oxide	FOR-Cruse
ERO-HCno	ERO-Metal Film	ERS-Wire Wound
Wattage		

18.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PSJE1043Z	LEAD WIRE, FFC (33P)	
2	PSWQHCM311A	TILT MOTOR UNIT	
3	PSWQHCM311N	PAN MOTOR UNIT	
4	PSKV1040Y2	EYE CENTER COVER	ABS+PC-V0
5	PSLP1315Z	LENS UNIT	
6	PSKE1073Y2	EYE RIGHT COVER	ABS+PC-V0
7	PSKE1072Y2	EYE LEFT COVER	ABS+PC-V0
8	PSKM1116W1	CABINET BODY	ABS+PC-V0
9	PSMG1007Z	RUBBER PARTS,MIC COVER	
10	PSJM1006Z	MICROPHONE	
11	PSHR1322Y	OPTIC CONDUCTIVE PARTS, LED LENS	ABS-HB
12	PSKV1041Z	COVER, DOME	PC-HB
13	PSHR1318Z	PAN GEAR	POM-HB
14	PSHX1247Z	PLASTIC PARTS, LOWER SHEET	
15	PSHG1264Z	RUBBER PARTS, SD	
16	PSKF1089W1	CABINET COVER	ABS+PC-V0
17	PSGT2647Z	NAME PLATE	
18	PSKV1039Y2	LENS COVER	ABS-V0
19	PSUP1508Z	LEAD WIRE, FPC CABLE	
20	PSMH1277Z	ANGLE, PLATE-1	
21	PSMH1301Z	ANGLE, I/O PLATE	
22	J0KD00000090	SPACER, FILTER	
23	PSHS1048Z	FELT PARTS, FPC TAPE	
24	PSHS1051Z	FELT PARTS, CPRE TAPE	
25	PSQT2130Z	FCC CAUTION LABEL	
26	PSHG1251Z	RUBBER PARTS, CABI SEAL	
27	PSHG1253Z	RUBBER PARTS, LED SEAL	
28	PSHX1244Z	WATER SHIELD PARTS, MIC SHEET	
29	PSHG1252Z	RUBBER PARTS, DOME SEAL	
30	PSSA1033Z	ANTENNA	
31	PSHG1261Z	RUBBER PARTS, ANTENNA SEAL	
32	PSHR1341Z	SPACER, RF	
33	PSHG1262Z	RUBBER PARTS, HEAT	
34	PSHS1053Z	PLASTIC PARTS, ANTENNA SHEET	
35	PSHX1246Z	PLASTIC PARTS, PROTECT SHEET	
36	PSMH1302Z	ANGLE, HEAT SINK	
37	PSMC1117ZA	SHIELD, CABI SHEET	
38	PSHG1263Z	RUBBER PARTS, HEAT	
39	PSJE1048Z	LEAD WIRE, FFC (20P)	
40	PSWP4HCM371A	RF BOARD ASS'Y	

18.2. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV202W	AC ADAPTOR	
A2	PSJA1069Z	POWER CORD	
A3	XZB20X30A05	PROTECTION COVER(FOR SET etc.)	
A4	PSYCHCM331N	CABLE COVER	
A4-1	PSHG1258Z	RUBBER PARTS, CABLR COVER SEAL	
A4-2	PSHX1201Z	SHEET	
A5	PQHE5004Y	SCREW	
A6	XZB05X08A03	PROTECTION COVER (FOR SCREWS)	
A7	XTN26+10GVW	SCREW	
A8	XZB15X20A04	PROTECTION COVER (FOR CABLE etc.)	
A9	PSKV1051Z1	COVER, SUN SHADE	
A10	PSKL1026Z	STAND	
A11	PSHG1235Z	TAPE	
A12	PSHG1259Z	RUBBER PARTS, PUTTY	
A13	XZB10X20A04	PROTECTION COVER (FOR TAPE etc.)	
A14	PSQX3499ZCD	CD-ROM, SETUP	
A15	PSQW2225Z	LEAFLET	
A16	PSQW2285Z	LEAFLET	
A17	PSQX3498Z	INSTALLATION/TROUBLESHOOTING	
A18	PSPH1012Z	PROTECTION COVER	
P1	PSPK2294Z	GIFT BOX	
P2	PSPN1177Z	ACCESSORY BOX	
P3	PSPN1176Z	ACCESSORY BOX	
P4	PSPD1302Z	CUSHION, LOWER	
P5	PSPD1299Z	CUSHION, SET	

18.3. MAIN BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PSWP1HCM371A	MAIN BOARD ASS'Y (RTL)	
		(Included New MAC address label)	
		(ICS)	
IC101	PSWIHCM371A	IC	
IC102	C0JBAF000548	IC	
IC103	C1DB00001114	IC	
IC104	C0EBE0000231	IC	
IC105	C3ABPG000129	IC	S
IC106	C0JBAB000636	IC	
IC201	C0GBF0000020	IC	
IC202	C1CB00001887	IC	
IC203	C1CB00001822	IC	
IC303	RPI-352	IC	S
IC305	C0BBBA000044	IC	
IC306	MN5774	IC	
IC403	C0DBAFZ00054	IC	
IC404	C0DBAFZ00054	IC	
IC405	C1CB00001918	IC	
IC407	C0CBCAD00039	IC	
IC409	C0DBAFZ00054	IC	
		(TRANSISTORS)	
Q101	PQVTDTC143E	TRANSISTOR(SI)	S
Q201	PQVTDTA143TU	TRANSISTOR(SI)	S
Q203	PQVTDTA143TU	TRANSISTOR(SI)	S

Ref. No.	Part No.	Part Name & Description	Remarks
Q301	PQVTDTC143E	TRANSISTOR(SI)	S
Q401	B1DHCD000018	TRANSISTOR(SI)	
Q402	B1DHCD000018	TRANSISTOR(SI)	
Q403	B1DHCD000018	TRANSISTOR(SI)	
Q501	B1GBGFCJ0002	TRANSISTOR(SI)	
Q503	PQVTDTA143EU	TRANSISTOR(SI)	S
Q504	PQVTDTA143EU	TRANSISTOR(SI)	S
		(DIODES)	
D101	MA3082	DIODE(SI)	S
D401	MA111	DIODE(SI)	S
D402	MA741WK	DIODE(SI)	S
D403	MA736	DIODE(SI)	S
D404	MA736	DIODE(SI)	S
D405	MA736	DIODE(SI)	S
DA301	MA143A	DIODE(SI)	S
		(BATTERY)	
BAT401	BR-2032-1VC	LITHIUM BATTERY	
		(CAPACITORS)	
C102	ECUV1C104KBV	0.1	S
C103	F1J0J1060006	10	
C104	ECUV1H101JCV	100P	S
C105	ECUV1C104KBV	0.1	S
C106	ECUV1A105ZFV	1	S
C108	ECUV1A105ZFV	1	S
C109	ECUV1C104KBV	0.1	S
C110	ECUV1H180JCV	18P	S
C111	ECUV1H200JCV	20P	
C112	ECUV1A105ZFV	1	S
C113	ECUV1C104KBV	0.1	S
C114	F1J0J1060006	10	
C115	ECUV1C104KBV	0.1	S
C117	ECUV1C104KBV	0.1	S
C118	ECUV1C224ZFV	0.22	S
C120	ECUV1C104KBV	0.1	S
C121	ECUV1E103KBV	0.01	
C122	ECUV1E103KBV	0.01	
C123	ECUV1C104KBV	0.1	S
C124	ECUV1C104KBV	0.1	S
C125	ECUV1E103KBV	0.01	
C126	ECUV1E103KBV	0.01	
C128	ECUV1C104KBV	0.1	S
C129	ECUV1C104KBV	0.1	S
C130	F1J0J1060006	10	
C131	ECUV1H101JCV	100P	S
C132	ECUV1C104KBV	0.1	S
C133	ECUV1C104KBV	0.1	S
C134	ECUV1C104KBV	0.1	S
C135	ECUV1C104KBV	0.1	S
C136	ECUV1C104KBV	0.1	S
C137	ECUV1E103KBV	0.01	
C138	ECUV1E103KBV	0.01	
C139	ECUV1C104KBV	0.1	S
C140	ECUV1C104KBV	0.1	S
C141	ECUV1E103KBV	0.01	

City	Country	City
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Ref. No.	Part No.	Part Name & Description	Remarks
C142	ECUV1E103KBV	0.01	
C143	ECUV1C104KBV	0.1	S
C144	ECUV1C104KBV	0.1	S
C145	ECUV1E103KBV	0.01	
C146	ECUV1E103KBV	0.01	
C147	ECUV1C104KBV	0.1	S
C148	ECUV1C104KBV	0.1	S
C149	ECUV1C104KBV	0.1	S
C150	ECUV1C104KBV	0.1	S
C151	ECUV1E103KBV	0.01	
C152	ECUV1E103KBV	0.01	
C153	ECUV1C104KBV	0.1	S
C154	ECUV1C104KBV	0.1	S
C155	ECUV1E103KBV	0.01	
C156	ECUV1E103KBV	0.01	
C157	ECUV1C104KBV	0.1	S
C158	ECUV1C104KBV	0.1	S
C159	F1J0J1060006	10	
C160	F1J0J1060006	10	
C161	ECUV1H220JCV	22P	S
C162	ECUV1A105ZFV	1	S
C164	ECUV1C104KBV	0.1	S
C165	ECUV1E103KBV	0.01	
C166	ECUV1C104KBV	0.1	S
C167	ECUV1E103KBV	0.01	
C168	ECUV1C104KBV	0.1	S
C169	ECUV1E103KBV	0.01	
C170	ECUV1C104KBV	0.1	S
C171	ECUV1C104KBV	0.1	S
C172	ECUV1C104KBV	0.1	S
C190	ECUV1C104KBV	0.1	S
C192	ECUV1E103KBV	0.01	
C193	ECUV1C104KBV	0.1	S
C201	ECUV1C104KBV	0.1	S
C202	ECUV1C104KBV	0.1	S
C203	ECUV1H120JCV	12P	S
C204	ECUV1H120JCV	12P	S
C206	ECUV1C104KBV	0.1	S
C207	ECUV1E103KBV	0.01	
C208	F1J0J1060006	10	
C213	ECJ1VC1H040C	4P	
C214	ECUV1C104KBV	0.1	S
C215	ECUV1C104KBV	0.1	S
C220	ECUV1C104KBV	0.1	S
C222	ECUV1C104KBV	0.1	S
C224	ECUV1C104KBV	0.1	S
C225	ECUV1C104KBV	0.1	S
C226	ECUV1C104KBV	0.1	S
C227	ECUV1C104KBV	0.1	S
C307	ECUV1C104KBV	0.1	S
C320	ECUV1C104KBV	0.1	S
C322	ECUV1C104KBV	0.1	S
C323	F1J0J1060006	10	
C324	ECUV1H101JCV	100P	S
C325	ECUV1C104KBV	0.1	S
C327	ECUV0J105KBV	1	S
C330	ECUV1H150JCV	15P	S

Ref. No.	Part No.	Part Name & Description	Remarks
C401	F2B1E1020001	1000	
C402	PFCX1EY106ZF	10	S
C403	PFCX1EY106ZF	10	S
C404	ECUV1H104ZFV	0.1	S
C405	ECUV1H104ZFV	0.1	S
C406	PFCX1EY106ZF	10	S
C407	PFCX1EY106ZF	10	S
C408	ECUV1C104KBV	0.1	S
C411	ECUV1E103KBV	0.01	
C412	ECUV1E103KBV	0.01	
C413	F4Z0J4760001	47	
C414	F4Z0J4760001	47	
C415	ECUV1C104KBV	0.1	S
C416	ECUV1C104KBV	0.1	S
C417	F1J0J1060006	10	
C418	F1J0J1060006	10	
C420	ECUV1A105ZFV	1	S
C422	ECUV1C104KBV	0.1	S
C424	ECUV1C104KBV	0.1	S
C426	F1J0J1060006	10	
C427	PFCX1EY106ZF	10	S
C428	ECUV1H104ZFV	0.1	S
C431	ECUV1E103KBV	0.01	
C432	F4Z0J4760001	47	
C433	ECUV1C104KBV	0.1	S
C434	F1J0J1060006	10	
C444	ECUV1A105ZFV	1	S
C501	ECUV1C104KBV	0.1	S
C502	F1J0J1060006	10	
C503	ECUV1C104KBV	0.1	S
C504	ECUV1C104KBV	0.1	S
C506	ECUV1H221JCV	220P	S
C510	ECUV1H221JCV	220P	S
C516	ECUV1H221JCV	220P	S
C522	ECUV1H221JCV	220P	S
C540	ECUV1H102KBV	0.001	S
C543	ECUV1C104KBV	0.1	S
C544	ECUV1C104KBV	0.1	S
C545	ECUV1C104KBV	0.1	S
C546	ECUV1C104KBV	0.1	S
		(CONNECTORS AND JACKS)	
CN201	K1MN04B00042	CONNECTOR, 4P	
CN202	PQJS20A62Z	CONNECTOR, 20P	S
CN301	K1NA09E00022	CONNECTOR, 9P	
CN501	K1MN33B00016	CONNECTOR, 33P	
CN502	K1MN27B00030	CONNECTOR, 27P	
		(COILS AND CERAMIC FILTER)	
L101	G1C100K00031	COIL	
L201	J0JBC0000071	CERAMIC FILTER	
L202	G1CR12J00003	COIL	
L203	J0JBC0000071	CERAMIC FILTER	
L401	G1C220ZA0011	COIL	
L402	G1C220ZA0011	COIL	
L403	G1C100M00027	COIL	
L404	G1C100M00027	COIL	

Ref. No.	Part No.	Part Name & Description	Remarks
L405	G1A220GA0005	COIL	
L407	G1C100K00031	COIL	
L501	G1C100K00031	COIL	
L502	PQLQR1RS241	COIL	S
R101	PQLQR1RM471	COIL	S
R231	J0JCC0000079	FILTER	
R232	J0JCC0000079	FILTER	
R233	J0JCC0000079	FILTER	
R234	J0JCC0000079	FILTER	
		(RESISITORS)	
R102	ERJ3GEYJ103	10K	
R103	ERJ3GEY0R00	0	
R104	ERJ3GEYJ272	2.7K	
R105	ERJ3GEYJ101	100	
R107	ERJ3GEYJ103	10K	
R109	ERJ3GEYJ103	10K	
R110	ERJ3GEYJ103	10K	
R111	ERJ3GEYJ103	10K	
R114	ERJ3GEYJ103	10K	
R116	ERJ3GEYJ103	10K	
R117	ERJ3GEYJ103	10K	
R119	ERJ3GEYJ103	10K	
R120	ERJ3GEYJ101	100	
R121	ERJ3GEYJ105	1M	
R122	ERJ3GEYJ103	10K	
R123	ERJ3GEYJ103	10K	
R124	ERJ3GEYJ101	100	
R125	ERJ3GEY0R00	0	
R126	ERJ3GEYJ271	270	
R130	ERJ3GEYJ330	33	
R131	ERJ3GEY0R00	0	
R132	ERJ3GEYJ103	10K	
R133	ERJ3GEYJ473	47K	
R134	ERJ3GEYJ473	47K	
R135	ERJ3GEYJ473	47K	
R138	ERJ3GEY0R00	0	
R139	ERJ3GEYJ103	10K	
R140	ERJ3GEYJ473	47K	
R201	ERJ3GEYJ103	10K	
R202	ERJ3GEYJ102	1K	
R203	ERJ3GEYJ103	10K	
R204	ERJ3EKF2002	20K	
R205	ERJ3EKF1001	1K	
R206	ERJ3GEY0R00	0	
R207	ERJ3GEY0R00	0	
R208	ERJ3GEY0R00	0	
R209	ERJ3GEY0R00	0	
R210	ERJ3EKF1541	1.54K	
R211	ERJ3GEYJ103	10K	
R212	ERJ3GEYJ103	10K	
R213	ERJ3GEYJ103	10K	
R214	ERJ3GEYJ103	10K	
R215	ERJ3EKF47R0	47	
R216	ERJ3EKF47R0	47	
R217	ERJ3EKF51R1	51.1	

TABLE	RESEARCH UNIT	UNIT
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Ref. No.	Part No.	Part Name & Description	Remarks
R218	ERJ3EKF51R1	51.1	
R219	ERJ3GEYJ470	47	
R220	ERJ3GEYJ470	47	
R221	ERJ3GEYJ470	47	
R223	ERJ3GEYJ470	47	
R225	ERJ3GEYJ470	47	
R226	ERJ3GEYJ470	47	
R310	ERJ3GEYJ103	10K	
R311	ERJ3GEYJ103	10K	
R312	ERJ3GEY0R00	0	
R313	ERJ3GEY0R00	0	
R314	ERJ3GEY0R00	0	
R315	ERJ3GEY0R00	0	
R316	ERJ3GEYJ103	10K	
R317	ERJ3GEY0R00	0	
R318	ERJ3GEYJ103	10K	
R319	ERJ3GEYJ103	10K	
R320	ERJ3GEYJ104	100K	
R321	ERJ3GEYJ104	100K	
R322	ERJ3GEYJ472	4.7K	
R323	ERJ3GEYJ103	10K	
R325	ERJ3GEYJ472	4.7K	
R326	ERJ3GEYJ104	100K	
R328	ERJ3GEYJ104	100K	
R329	ERJ3GEYJ103	10K	
R330	ERJ3GEYJ103	10K	
R331	ERJ3GEYJ101	100	
R333	ERJ3GEYJ470	47	
R334	ERJ3GEYJ470	47	
R335	ERJ3GEYJ470	47	
R336	ERJ3GEYJ470	47	
R337	ERJ3GEYJ470	47	
R338	ERJ3GEYJ470	47	
R339	ERJ3GEYJ470	47	
R340	ERJ3GEYJ470	47	
R341	ERJ3GEYJ103	10K	
R342	ERJ3GEYJ103	10K	
R344	ERJ3GEY0R00	0	
R345	ERJ3GEYJ103	10K	
R401	ERJ3GEYJ152	1.5K	
R402	ERJ3GEYJ100	10	
R403	ERJ3GEYJ100	10	
R404	ERJ3GEYJ470	47	
R405	ERJ3GEYJ470	47	
R406	ERJ3GEY0R00	0	
R407	ERJ3GEY0R00	0	
R408	ERJ3GEYJ332	3.3K	
R409	ERJ3EKF2702	27K	
R410	ERJ3EKF1202	12K	
R411	ERJ3EKF4702	47K	
R412	ERJ3EKF2002	20K	
R413	ERJ3GEYJ272	2.7K	
R414	ERJ3GEYJ272	2.7K	
R416	PQ4R10XJ271	270	S
R417	ERJ3GEYJ100	10	
R418	ERJ3GEYJ470	47	
R420	ERJ3EKF3302	33K	

11120	1100000000	0000	
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Ref. No.	Part No.	Part Name & Description	Remarks
R421	ERJ3GEYJ561	560	
R422	ERJ3GEYJ272	2.7K	
R501	ERJ3GEYJ470	47	
R502	ERJ3GEYJ470	47	
R503	ERJ3GEYJ470	47	
R504	ERJ3GEYJ470	47	
R505	ERJ3GEYJ470	47	
R506	ERJ3GEYJ470	47	
R507	ERJ3GEYJ470	47	
R508	ERJ3GEYJ470	47	
R509	ERJ3GEYJ470	47	
R510	ERJ3GEYJ470	47	
R511	ERJ3GEY0R00	0	
R512	ERJ3GEY0R00	0	
R513	ERJ3GEY0R00	0	
R514	ERJ3GEY0R00	0	
R515	ERJ3GEY0R00	0	
R516	ERJ3GEYJ470	47	
R518	ERJ3GEYJ101	100	
R520	ERJ3GEYJ561	560	
R521	ERJ3GEYJ561	560	
R522	ERJ3GEYJ470	47	
R523	ERJ3GEYJ470	47	
R525	ERJ3GEYJ470	47	
R526	ERJ3GEYJ470	47	
R529	ERJ3GEYJ103	10K	
R530	ERJ3GEYJ103	10K	
R531	ERJ3GEYJ470	47	
R532	ERJ3GEY0R00	0	
R533	ERJ3GEYJ470	47	
R534	ERJ3GEY0R00	0	
R535	ERJ3GEY0R00	0	
R536	ERJ3GEYJ470	47	
R537	ERJ3GEY0R00	0	
R538	ERJ3GEYJ470	47	
R539	ERJ3GEYJ332	3.3K	
R540	ERJ3GEYJ332	3.3K	
		(COMPONENTS PARTS)	
RA201	D1H84704A037	RESISTOR ARRAY, 47	
RA202	D1H84704A037	RESISTOR ARRAY, 47	
RA301	D1H83304A036	RESISTOR ARRAY, 33	
RA302	D1H83304A036	RESISTOR ARRAY, 33	
RA303	D1H83304A036	RESISTOR ARRAY, 33	
RA304	D1H83304A036	RESISTOR ARRAY, 33	
RA305	D1H83304A036	RESISTOR ARRAY, 33	
RA306	D1H83304A036	RESISTOR ARRAY, 33	
RA307	D1H81034A037	RESISTOR ARRAY, 10K	
RA502	PSLQR2C601MT	RESISTOR ARRAY, 601	
RA503	PSLQR2C601MT	RESISTOR ARRAY, 601	
		(SWITCH)	
SW101	EVQPSM02K	SWITCH, TACTILE	
SW102	EVQPSM02K	SWITCH, TACTILE	
		(CRYSTAL OSCILLATORS)	
X101	H0J163500016	CRYSTAL OSCILLATOR	

Ref. No.	Part No.	Part Name & Description	Remarks
X201	H0J250500044	CRYSTAL OSCILLATOR	
		(OTHERS)	
E1	PSHX1245Z	PLASTIC PARTS, SHEET	
E2	PSHX1205Z	PLASTIC PARTS, SHEET	
E3	PSHR1325Z	SPACER	

18.4. I/O BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PSWP2HCM371A	I/O BOARD ASS'Y (RTL)	
		(ICS)	
IC601	C1CB00001622	IC	
IC602	AN6123MS	IC	
IC603	AN6123MS	IC	
		(TRANSISTORS)	
Q601	PQVTDTC143E	TRANSISTOR(SI)	S
Q602	PQVTDTC143E	TRANSISTOR(SI)	S
Q603	B1ABCF000103	TRANSISTOR(SI)	
		(DIODES)	
D601	MA736	DIODE(SI)	S
DA601	MA143A	DIODE(SI)	S
DA602	MA143A	DIODE(SI)	S
DA603	MA143A	DIODE(SI)	S
LED601	B3AKB0000008	LED	
		(CAPACITORS)	
C601	ECUV1H100DCV	10P	S
C602	ECUV1C104KBV	0.1	S
C603	ECUV1H100DCV	10P	S
C605	ECUV1C104KBV	0.1	S
C606	ECST0JX476	47	
C607	PQCUV1A105KB	1	S
C608	ECUV1C104KBV	0.1	S
C609	ECST0JX476	47	
C610	ECUV1H104ZFB	0.1	S
C611	F1K3A222A002	0.0022	
C612	ECUV1C473KBV	0.047	S
C613	ECUV1C473KBV	0.047	S
C614	ECUV0J105KBV	1	S
C615	ECUV1H331JCV	330P	S
C617	ECUV1H331JCV	330P	S
C618	ECUV1C474KBV	0.47	
C619	ECUV1C474KBV	0.47	
C620	F1J0J1060006	10	
C621	ECUV1H104ZFB	0.1	S
C622	ECUV1C104KBV	0.1	S
C623	F1J0J1060006	10	
C624	F1J0J1060006	10	
C625	ECUV1C104KBV	0.1	S
C626	ECUV1C104KBV	0.1	S
C627	ECUV1H122KBV	0.0012	S

Ref. No.	Part No.	Part Name & Description	Remarks
C628	ECUV1H122KBV	0.0012	S
C629	ECUV0J105KBV	1	S
C630	ECUV1E104ZV	0.1	S
C631	F1J0J1060006	10	
C632	ECUV1A224KBV	0.22	S
C633	ECUV1E104ZV	0.1	S
C634	ECUV0J105KBV	1	S
C635	ECUV0J105KBV	1	S
C636	ECUV0J105KBV	1	S
C637	ECUV0J105KBV	1	S
C638	ECUV0J105KBV	1	S
C639	PQCUV1A105KB	1	S
C640	ECUV1C104KBV	0.1	S
C641	F1J0J1060006	10	
C642	F1J0J1060006	10	
C643	ECUV1C104KBV	0.1	S
C645	ECJ0EC1H100D	10P	
C646	ECJ0EC1H100D	10P	
C647	ECJ0EC1H100D	10P	
C648	ECJ0EC1H100D	10P	
		(CONNECTORS AND JACKS)	
CN601	K4BC06B00047	JACK	
CN602	PFJJ1B01Z	JACK	S
CN603	PQJJ1D010Z	JACK	S
CN604	K2HC103B0061	JACK	
CN605	K2LC108B0046	JACK	
CN606	PQJS33A62Z	CONNECTOR, 33P	
CN607	K1KA02AA0229	CONNECTOR, 2P	S
		(THERMISTOR)	
IP601	D4FBR2000002	THERMISTOR	
		(COILS AND CERAMIC FILTER)	
L601	G0B150G00002	COIL	
L602	G1C6R8Z00005	COIL	
L603	J0JCC0000079	CERAMIC FILTER	
L604	J0JCC0000079	CERAMIC FILTER	
L605	J0JCC0000079	CERAMIC FILTER	
L606	G1C100K00031	COIL	
L608	PQLQR1RS241	COIL	S
L609	J0JCC0000079	CERAMIC FILTER	
L610	J0JCC0000079	CERAMIC FILTER	
L611	J0JCC0000079	CERAMIC FILTER	
L612	J0JCC0000079	CERAMIC FILTER	
		COIL	S
		CERAMIC FILTER	
R641	PQLQR1RS241	COIL	S
R642	J0JCC0000079	CERAMIC FILTER	
R643	J0JCC0000079	CERAMIC FILTER	
R644	J0JCC0000079	CERAMIC FILTER	
		(RESISITORS)	
R601	ERJ3GEYJ750	75	
R602	ERJ3GEYJ750	75	
R603	ERJ3GEYJ222	2.2K	
R604	ERJ3GEYJ222	2.2K	

Ref. No.	Part No.	Part Name & Description	Remarks
R606	ERJ3GEYJ102	1K	
R607	ERJ3GEYJ102	1K	
R608	PQ4R18XJ100	10	S
R609	ERJ3GEY0R00	0	
R610	ERJ3GEYJ103	10K	
R611	ERJ3GEYJ103	10K	
R612	ERJ3GEYJ473	47K	
R613	ERJ3GEYJ203	20K	
R614	ERJ3GEYJ154	150K	
R615	ERJ3GEYJ750	75	
R616	ERJ3GEYJ750	75	
R617	ERJ3GEYJ154	150K	
R618	ERJ3GEYJ680	68	
R619	ERJ3GEYJ820	82	
R621	ERJ3GEYJ332	3.3K	
R622	ERJ3GEYJ332	3.3K	
R623	ERJ3GEYJ105	1M	
R624	ERJ3GEYJ105	1M	
R625	ERJ3GEYJ203	20K	
R626	ERJ3GEYJ203	20K	
R627	ERJ3GEYJ103	10K	
R628	ERJ3GEYJ103	10K	
R629	ERJ3GEYJ104	100K	
R630	ERJ3GEYJ105	1M	
R631	ERJ3GEYJ104	100K	
R632	ERJ3GEYJ104	100K	
R633	ERJ3GEY0R00	0	
R634	ERJ3GEY0R00	0	
R635	ERJ3GEY0R00	0	
R636	ERJ3GEY0R00	0	
R637	ERJ3GEY0R00	0	
R645	ERJ3GEYJ561	560	
		(VARISTORS)	
SA601	D4ZZ00000024	VARISTOR (SAUGE ABSORBER)	
SA602	D4ZZ00000024	VARISTOR (SAUGE ABSORBER)	
SA603	D4ZZ00000024	VARISTOR (SAUGE ABSORBER)	
SA604	D4ZZ00000024	VARISTOR (SAUGE ABSORBER)	
SA605	D4ZZ00000024	VARISTOR (SAUGE ABSORBER)	
SA606	D4ZZ00000024	VARISTOR (SAUGE ABSORBER)	
SA607	D4ZZ00000024	VARISTOR (SAUGE ABSORBER)	
SA608	D4ZZ00000024	VARISTOR (SAUGE ABSORBER)	
		(TRANSFORMER)	
T601	G5B1C0000011	TRANSFORMER	

18.5. SENSOR BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB3	PSWP3HCM371A	SENSOR BOARD ASS'Y (RTL)	
		(IC)	
IC71	B3NAA0000003	IC	
		(TRANSISTOR)	
Q71	PQVTDTC143E	TRANSISTOR(SI)	S
		(CAPACITORS)	
C71	ECUV1A105ZFV	1	S
C72	ECUV1C104KBV	0.1	S
		(CONNECTORS)	
CN71	K1MN08B00012	CONNECTOR, 8P	
CN72	K1MN04B00042	CONNECTOR, 4P	
		(COILS)	
L71	PQLQR1RS601T	COIL	S
L72	PQLQR1RS601T	COIL	S
L73	PQLQR1RS601T	COIL	S
L74	PQLQR1RS601T	COIL	S
		(RESISITORS)	
R71	ERJ3GEY0R00	0	
R72	ERJ3GEY0R00	0	
R73	ERJ3GEYJ101	100	

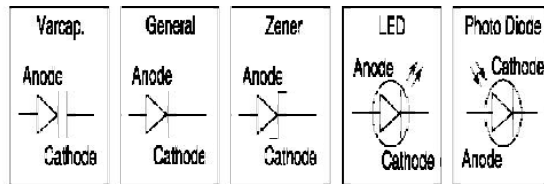
18.6. GREASE

Ref. No.	Part No.	Part Name & Description
	PSZYC10A	GREASE


19. FOR THE SCHEMATIC DIAGRAM

Note:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.



Important safety notice

Components identified by  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

20. SCHEMATIC DIAGRAM

20.1. WAVEFORM

21. CIRCUIT BOARD

21.1. MAIN BOARD (COMPONENT VIEW)

21.2. MAIN BOARD (BOTTOM VIEW)

21.3. I/O BOARD (COMPONENT VIEW)

21.4. I/O BOARD (BOTTOM VIEW)

21.5. SENSOR BOARD (COMPONENT VIEW)

21.6. SENSOR BOARD (BOTTOM VIEW)

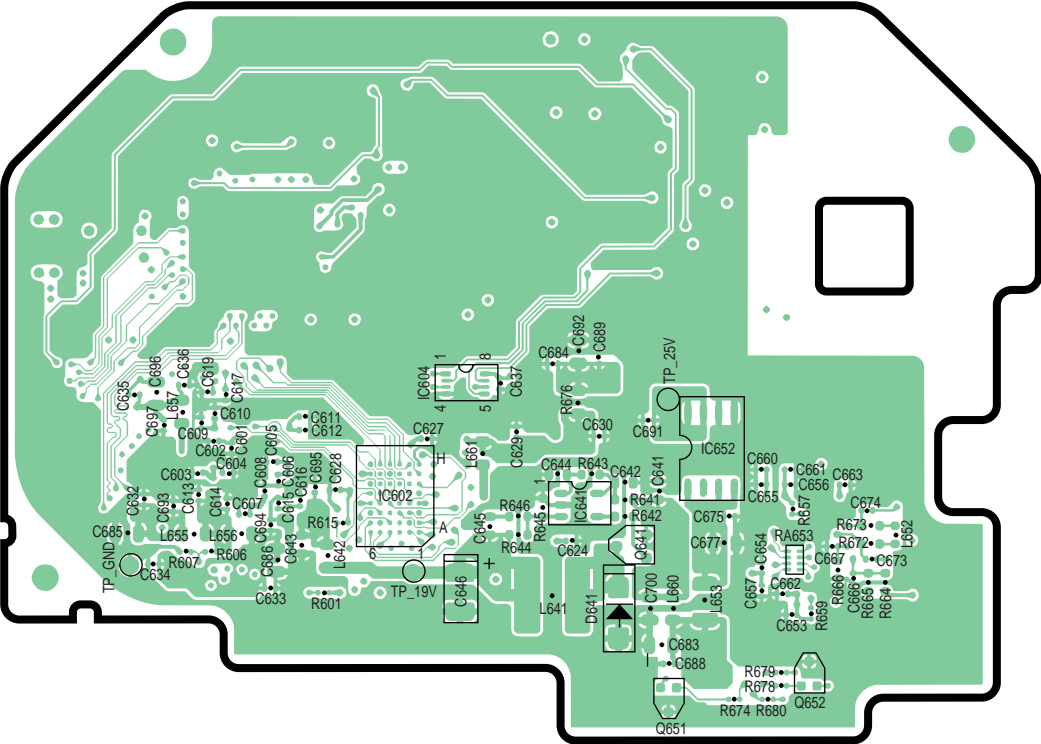
21.7. CAMERA BOARD (COMPONENT VIEW)

21.8. CAMERA BOARD (BOTTOM VIEW)

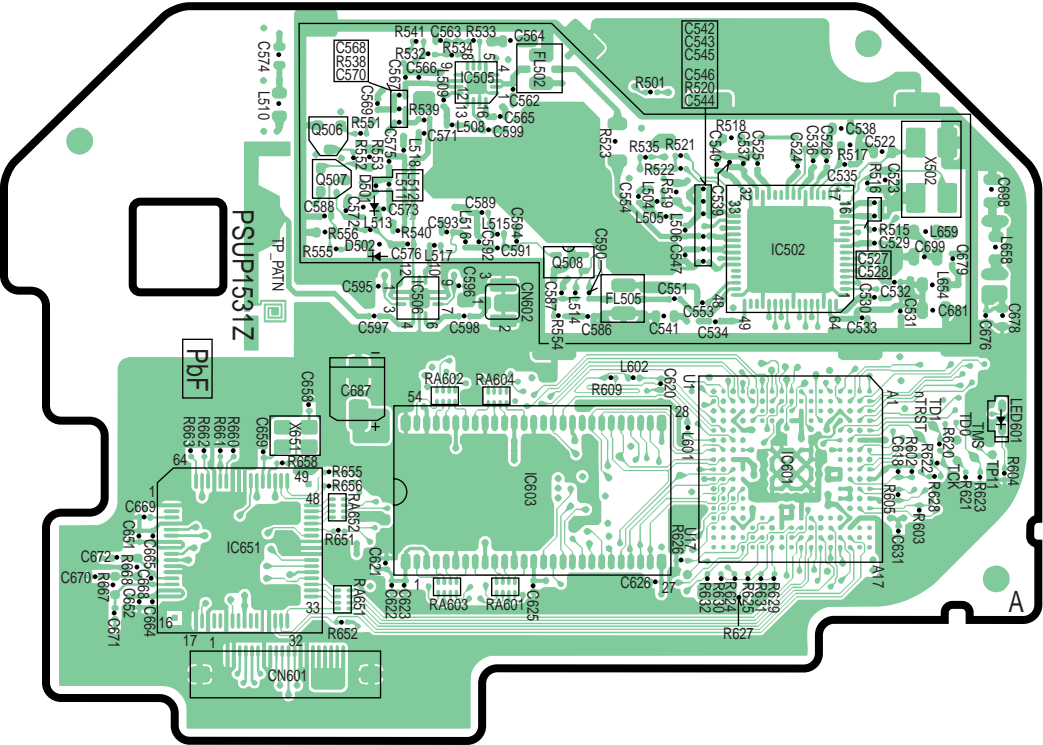
21.9. RF BOARD (COMPONENT VIEW)

21.10. RF BOARD (BOTTOM VIEW)

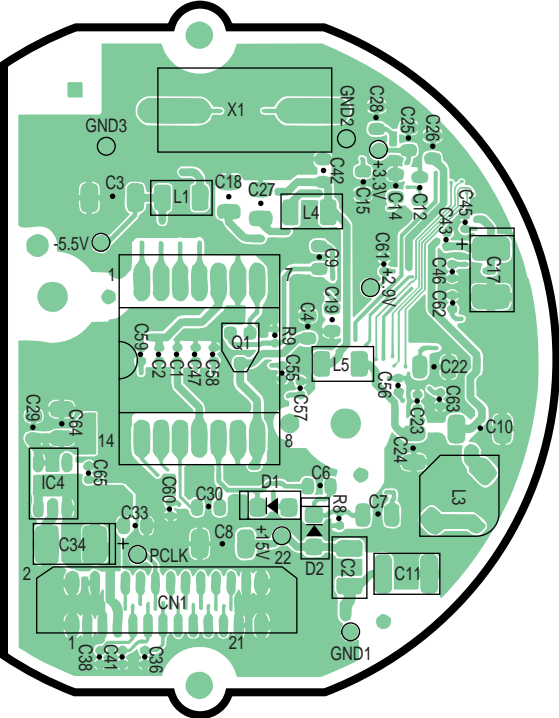
A BBHCM371A



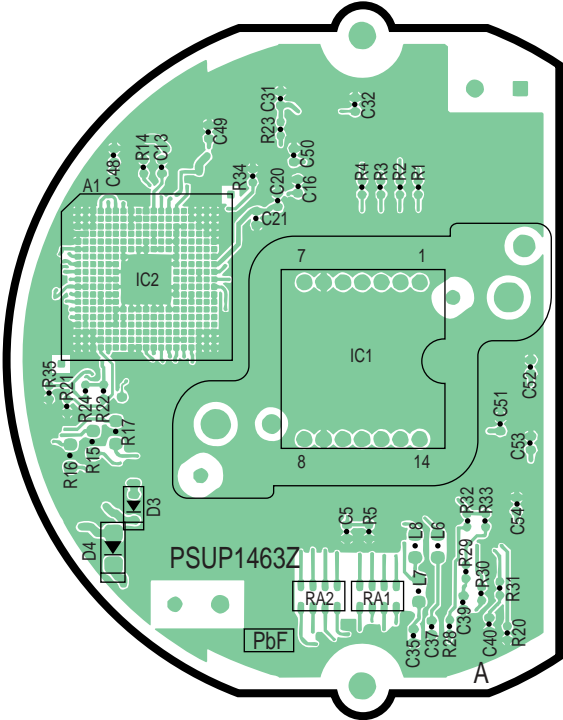
BB-HCM371A RF BOARD



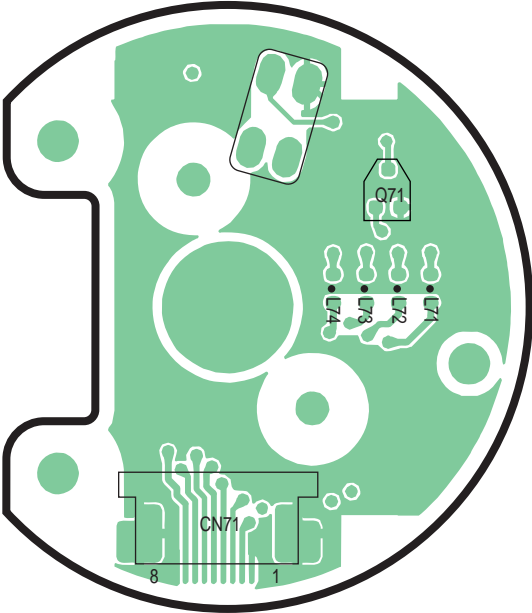
BB-HCM371A RF BOARD



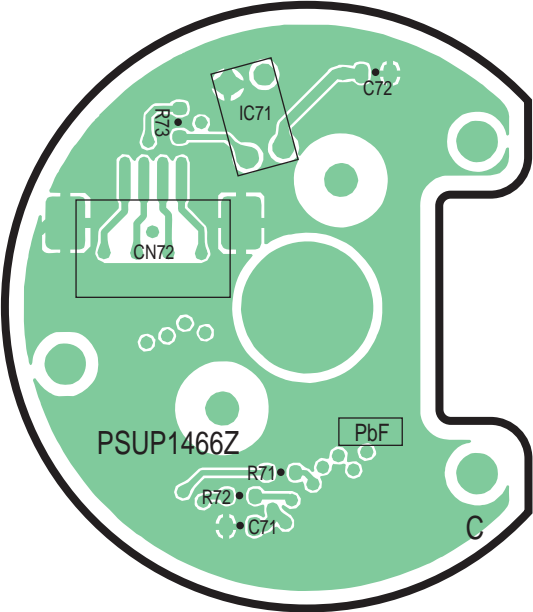
BB-HCM371A CAMERA BOARD



BB-HCM371A CAMERA BOARD



BB-HCM371A SENSOR BOARD



BB-HCM371A SENSOR BOARD

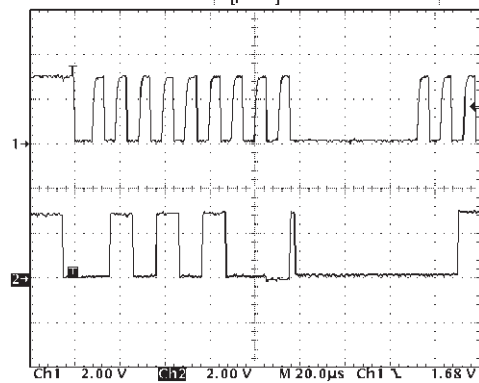






Tek Stop 2.50MS/s

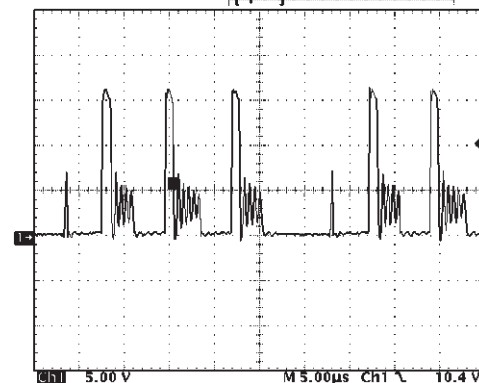
6 Acqs



A1

A2

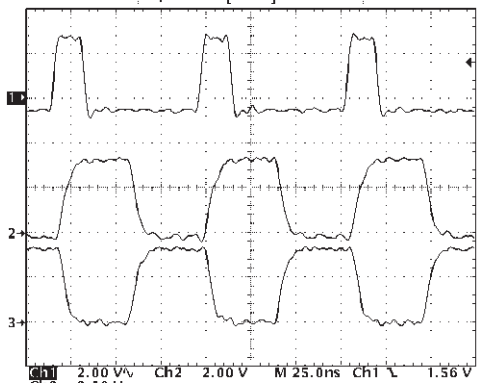
Tek Run: 10.0MS/s Sample



B

Tek Stop 500MS/s

32 Acqs

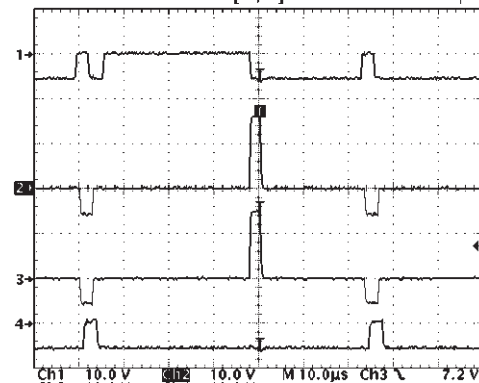


C1

C2

C3

Tek Run: 5.00MS/s Sample



D1

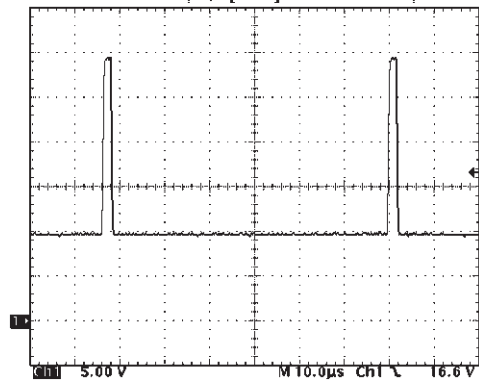
D2

D3

D4

Tek Stop 5.00MS/s

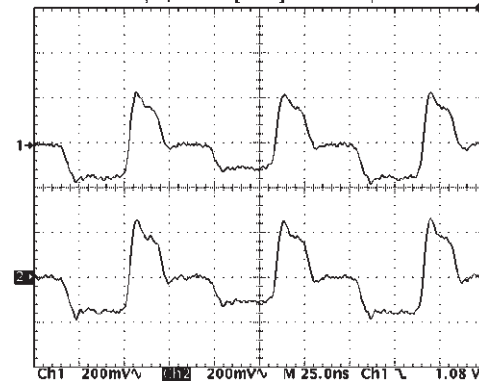
1658 Acqs



E

Tek Stop 1.00GS/s

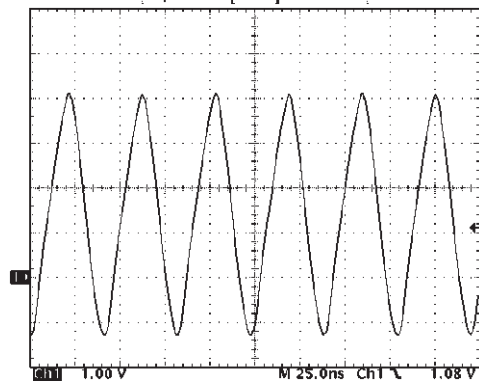
23 Acqs



F1

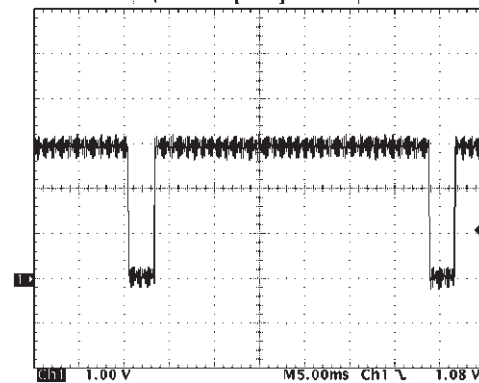
F2

Tek Run: 2.00GS/s Sample

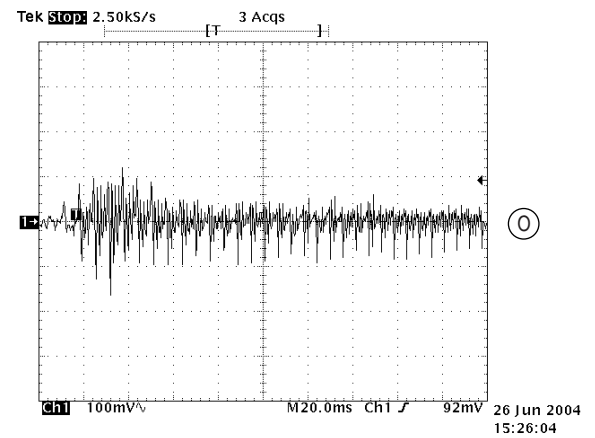
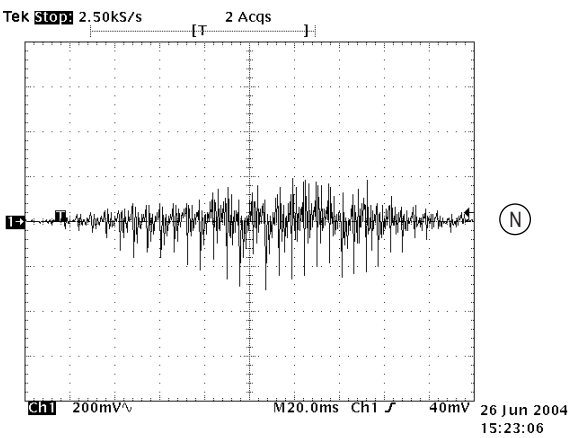
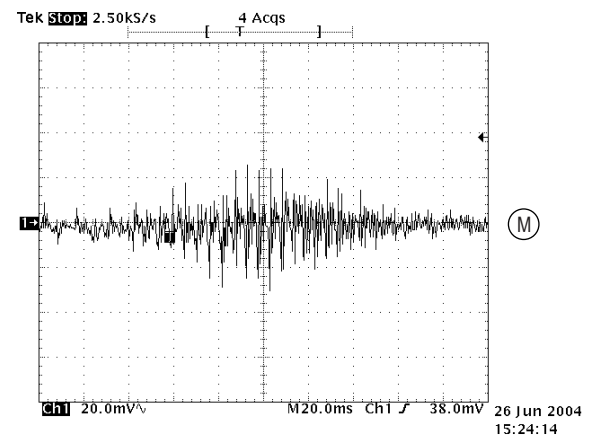
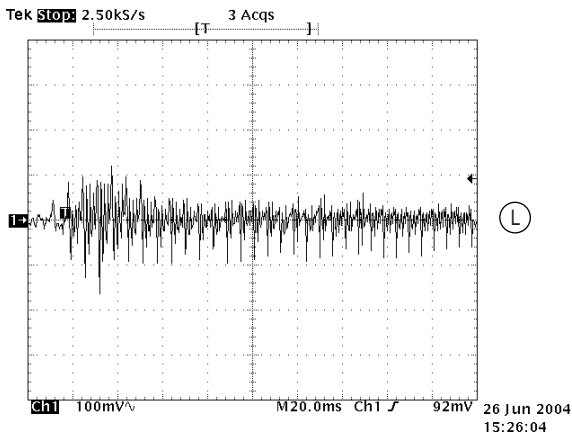
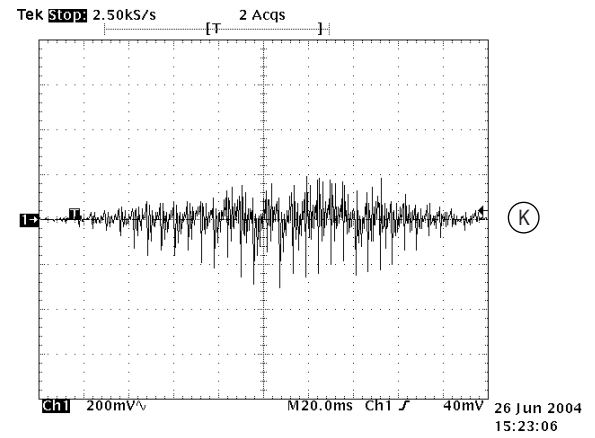
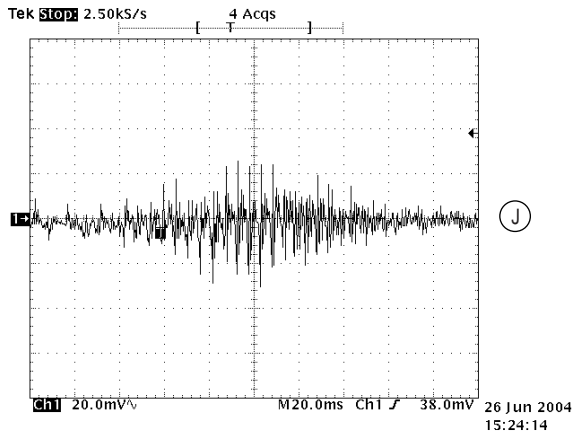
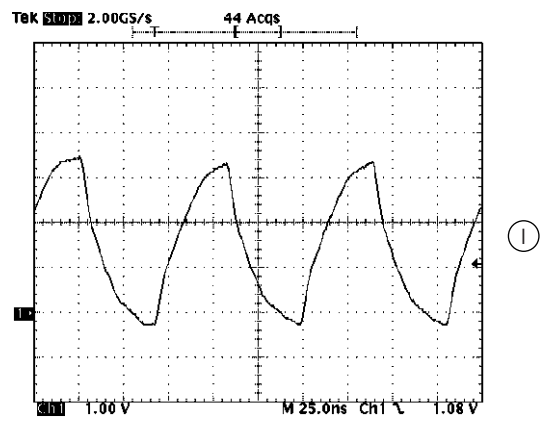
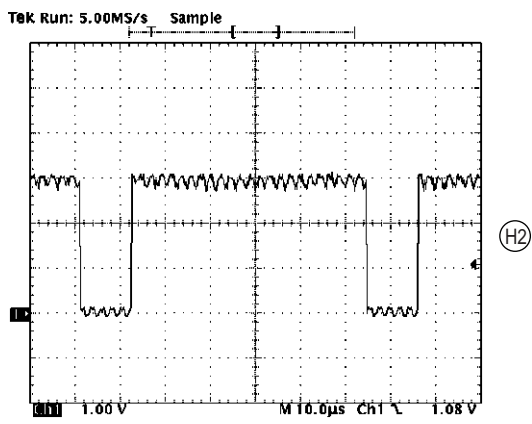


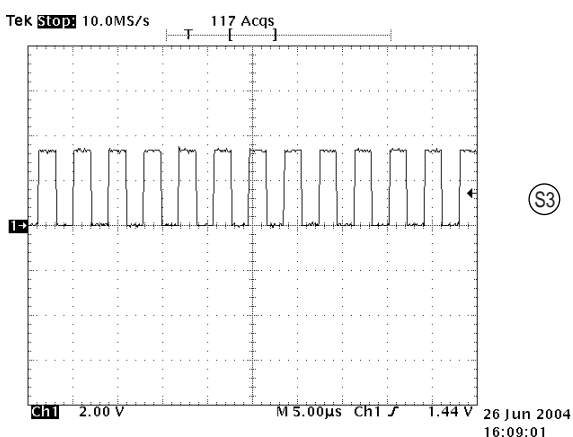
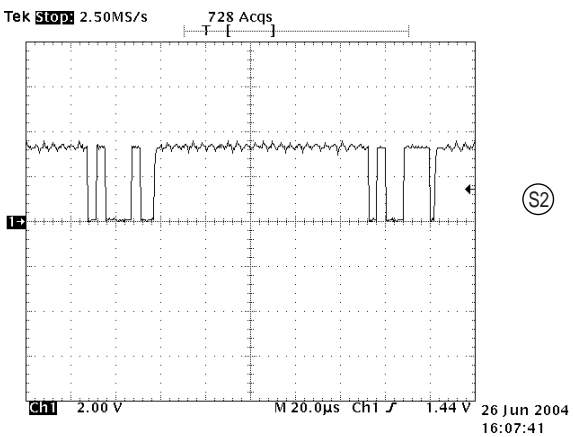
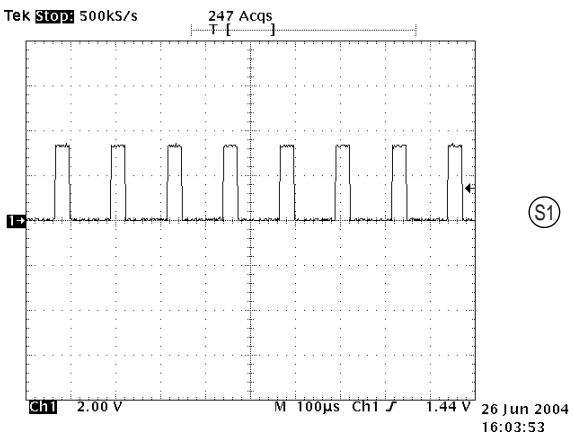
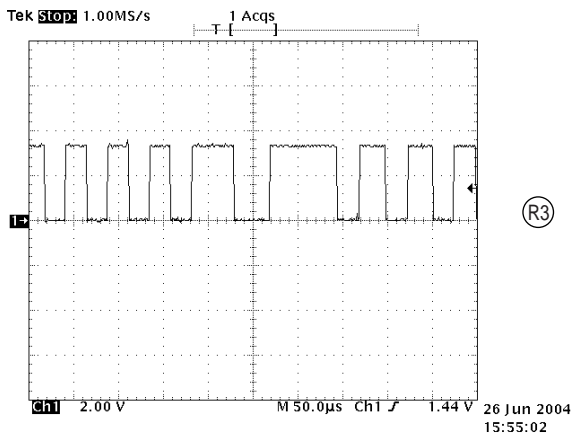
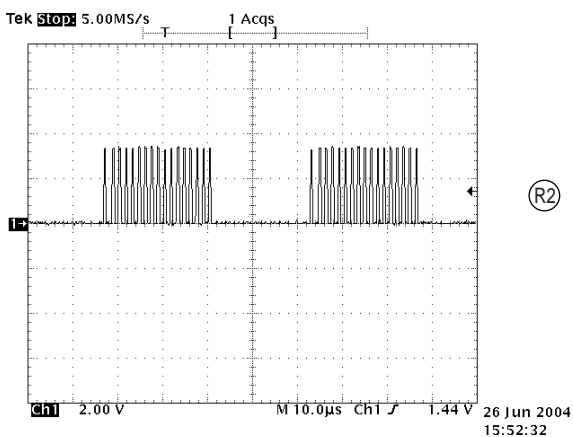
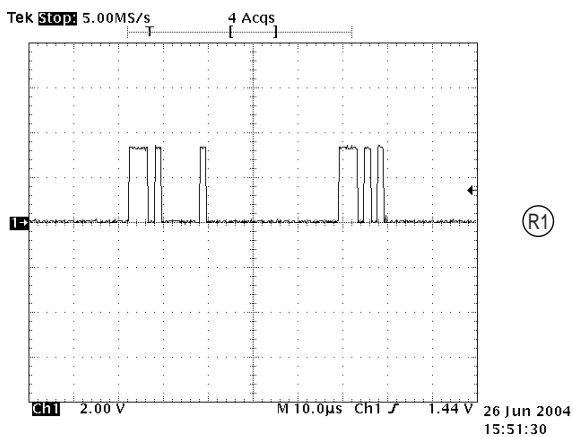
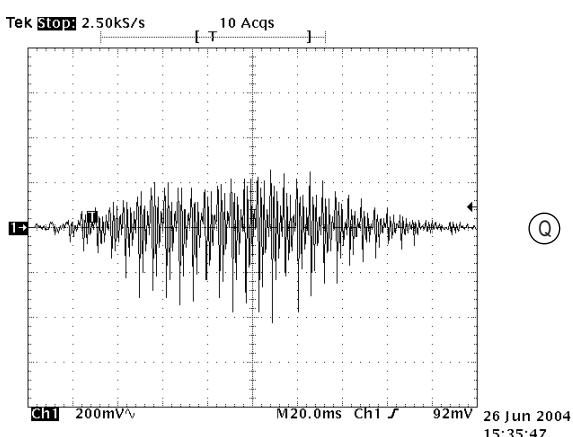
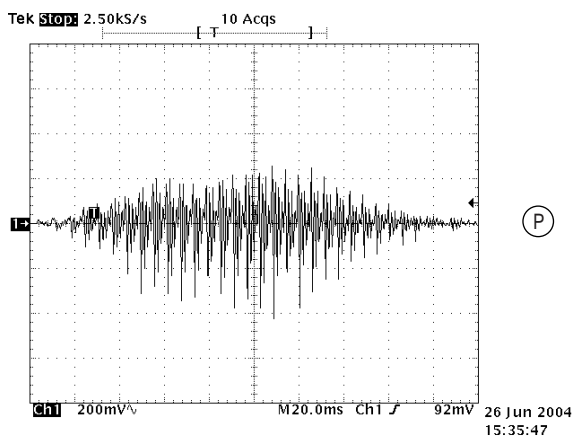
G

Tek Run: 10.0kS/s Sample

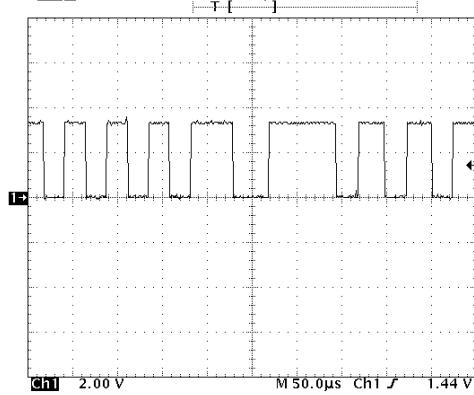


H1





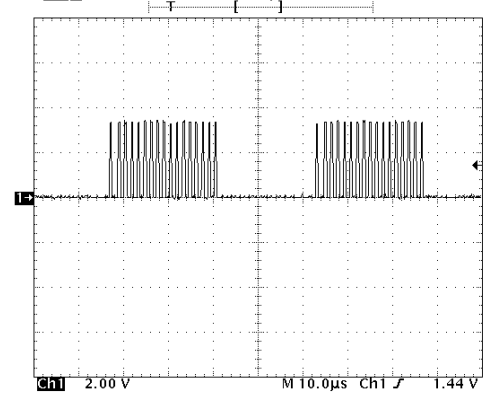
Tek Stop: 1.00MS/s



T1

26 Jun 2004
15:55:02

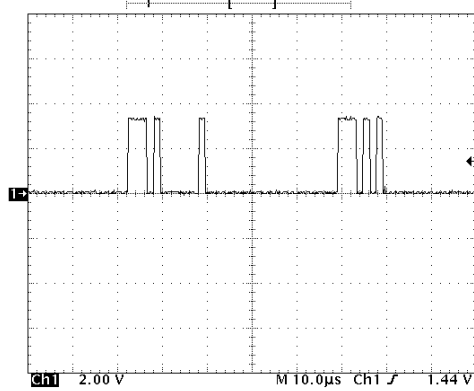
Tek Stop: 5.00MS/s



T2

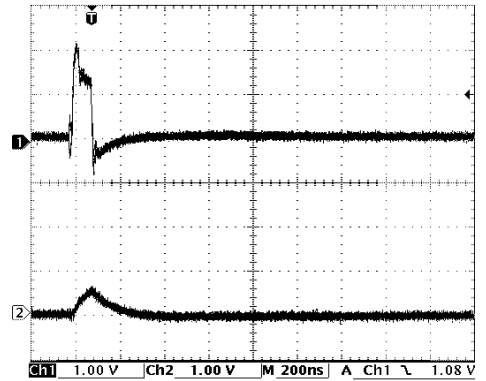
26 Jun 2004
15:52:32

Tek Stop: 5.00MS/s



T3

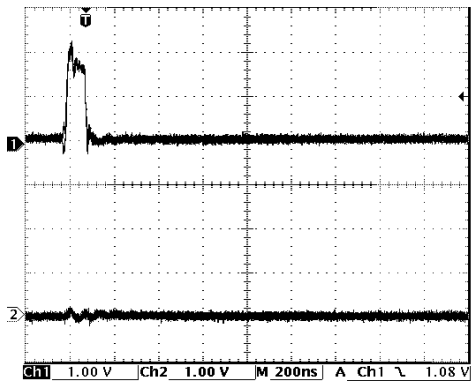
26 Jun 2004
15:51:30



U1

U2

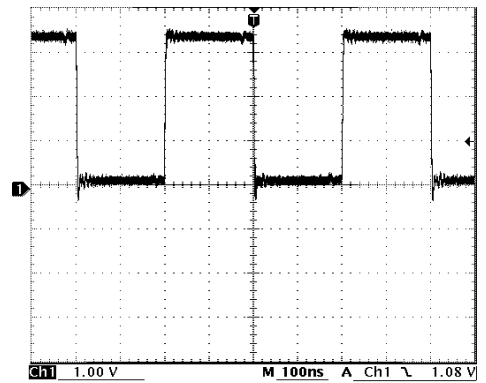
10Base Hub Connection (un-communicating)



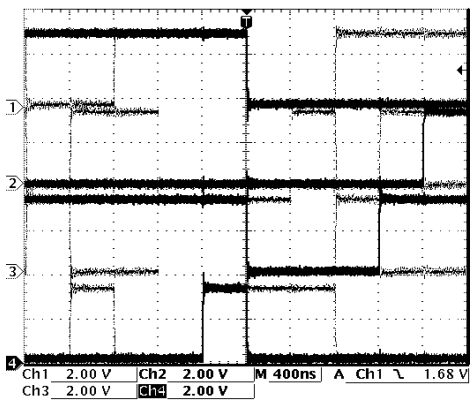
U3

U4

10Base Hub Connection (un-communicating)



U5



U6

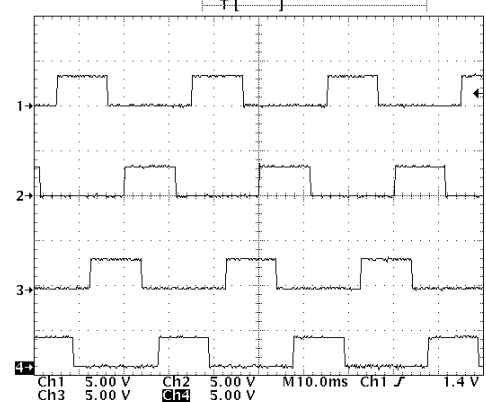
U7

U8

U9

10Base Hub Connection (Communicating)

Tek Stop: 5.00kS/s



W1

W2

W3

W4

